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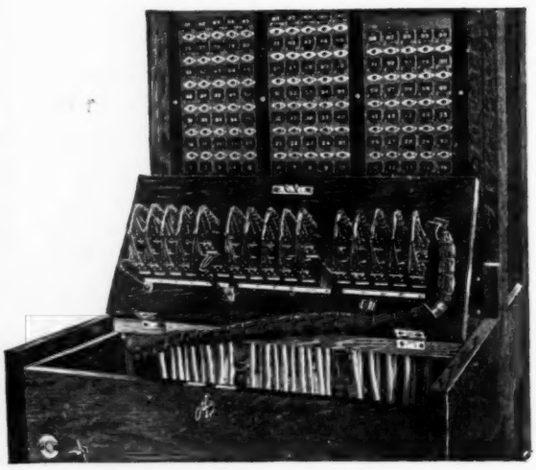

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Telephony.

THE AMERICAN TELEPHONE JOURNAL

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CURRENT OPINIONS AND COMMENTS

Owners of securities of public utility companies have reason to congratulate themselves as they read the newspapers these days. The daily press is full of stock fraud cases in which unwary investors and greedy seekers after big returns have been stung by wild-cat companies, fake brokers and bucket shops.

In New York, Chicago and many other financial centers, these get-rich-quick concerns have been collapsing by the score during recent weeks, and have carried down in the wreck millions of money that should have been employed to put the real business enterprises of the country on a go-ahead basis.

* * * *

Stock fraud cases are clogging the federal courts in every state, there being nearly 500 of this kind of prosecution on the dockets, and the Department of Justice is swamped with a flood of similar complaints. The "Ponzi" business is easy, for the crop of dupes seems limitless. The so-called "buyers' strike" we have heard so much about, apparently, was never extended to wild-cat stocks and get-rich-quick schemes.

Puck was right when he said in one of Shakespeare's plays, "What fools these mortals be," and Barnum was not far wrong either when he estimated the birth rate of suckers to be one a minute.

* * * *

The investor in public utilities, therefore, can pat himself on the back. He may be drawing only a comparatively modest rate of interest on his investment, without the thrill of *maybe, some time,* doubling his money by reasons of an oil gusher—but he can take comfort in the thought that he has his dollars in the safest business in the country, aside from the engraving plant which prints government bonds.

The public need of telephone service, gas, electric light and street railway facilities guarantees the permanency of the utility business, and the well-managed companies engaged in these lines have no fear of a loss of patronage. They do business with the entire community, and under the law the system of regulation by the state promises them a revenue that will enable them to pay a fair return on their capital.

* * * *

There is, of course, room for improvement in the situation of many utility companies. Both the public and the rate commissions should be more liberal in their treatment of service corporations. A more helpful policy would encourage investment in utility securities and give the companies more capital with which to improve and extend their service.

This will come as the public better understand the utility business. "Customer ownership" of utility securities will also aid this improvement, for, as patrons become owners of stock and bonds of a service company, they will naturally learn more about the industry which serves them, and greatly strengthen its public relations.

Telephone companies and other utilities should take advantage of the reaction from this wave of stock swindles, and push the absorption of their own securities among their patrons. Local communities must finance their local utilities to a large extent. It is a policy, as well as a necessity, that will prove profitable to both sides.

* * * *

TELEPHONY's editor received a letter the other day which proves that service and kindly courtesy pay. It was from a telephone man who has recently moved from a Southern city back to the North and visited a city where is located the company of which he was formerly manager. Writing from his new location he says:

"It surely is a great pleasure to be back among my warmest friends, even if I am in the frozen North. I did not know I had so many friends here. Don't think me egotistical, but it seems as though I am stopped by nearly every person I meet to say how glad he is to see me back again.

"Today one of my former subscribers who was digging a ditch waved to me. I stopped, and he told me he was glad to see me again, and that he had heard so many people say how much they regretted my leaving ———. He told me he had always been so grateful to me for attending to his telephone troubles when I was manager. I do not remember any special case, but it made me happy to have him say so after so many years. College professors and bank presidents have also stopped me and expressed pleasure in see-

ing me again, and how sorry they were that I left ———.

"I mention this only to show that *telephone subscribers do appreciate one's efforts to please.* I am happy to think that my work was appreciated. I had a difficult time at intervals, but I always smiled and took the position that my subscribers were co-operators and not complainers."

* * * *

Our correspondent reveals the secret of establishing friendly relations with the public. He did his best to serve his patrons, and they did not forget it. That kind of a man is always welcomed back to the job, and he can do his company a vast deal of good. He realizes as never before the importance of possessing the good will of the public, and we thank him for passing the lesson on to others.

* * * *

Reference was made last week to the question of commissions allowing federal income taxes paid by utility companies to be considered as an operating expense in arriving at service rates. C. B. Randall, general counsel for the Tri-State Telephone & Telegraph Co. of St. Paul, Minn., calls TELEPHONY's attention to a recent opinion of the United States Supreme Court which favors such action, and suggests that telephone companies should utilize this case in securing that concession from their state utility commissions.

Mr. Randall says: "Because of the fact that so many state commissions have, during the past few years, refused to allow federal income taxes as an operating expense, holding that they are a burden upon the stockholders, and not upon the operations of the company, I believe it would be advisable for your publication to emphasize the opinion of the United States Supreme Court handed down March 6 in the case, Newton, Attorney General of New York, et al., vs. Consolidated Gas Co. of New York.

"This decision, in effect, definitely decides this question contra to the holdings of these commissions, thus declaring that the federal income taxes are an operating expense and deductible as such in rate matters. In this case the trial court, Judge Hand, definitely held that the federal income taxes are an expense item, and constitute a part of the expenses to be deducted in order to arrive at the net revenue applicable to the return.

"While this matter is not mentioned in the opinion of the supreme court, the court does specifically state that all material questions raised upon the appeal (of which this was one), whether mentioned in the opinion or not, were considered by the court, and since the court affirmed Judge Hand's decision, that affirmance constitutes authority for the statement that these taxes are deductible expense items in rate matters."

In concluding his letter, General Counsel Randall says: "It occurred to me that if this were brought to the attention of all telephone men, as well as members of the commissions, through your publication, it might have a tendency to stop the dispute in this particular."

* * * *

Complete statistics of federal taxes paid by the utility companies for 1919 are now available, and show that the wire corporations contributed the bulk of the total. Telephone and telegraph companies paid $8,787,106; electric light and power companies, $5,804,003; gas companies, $1,214,980; waterworks, $873,440.

Government figures also show for that year that the aggregate net income of transportation and other public utilities was 6.38 per cent of their invested capital. Taken individually, the net income percentage of invested capital was: Steam railroads, 4.78; electric railroads, 4.11; gas companies, 6.07; telephone and telegraph companies, 7.01.

These returns certainly do not indicate that the utilities are enjoying swollen profits as is frequently declared.

House Connections to Underground

The Direct Connection from House to Underground Cable System as Developed in Cincinnati—Evolution of City's Underground Cable in Solving Problems Presented by Telephone Wires Along Streets and in Front of Buildings

By Felix J. Koch

Down Cincinnati way, just at present, the highways and the byways, the lanes and major residential thoroughfares, are presenting a curious paradox. Great, unsightly hummocks of earth trend along until they end at deep, even more unsightly ditches, beyond which other hummocks range along until some pile of solid rock, or some stack-work of bags of cement come squarely in the way.

The suburbs of Cincinnati are far from attractive just now, to say nothing of being decidedly unbeautiful. The work is progressing nicely, however, and, antithetical as it may seem, it is intended to do its bit—and a very big bit it is indeed—toward city beautiful and garden city, and all similar movements!

The Cincinnati & Suburban Bell Telephone Co. is extending its underground service by leaps and bounds; but, not content with removing unsightly poles and wires from the curb-sides, it is now attempting an innovation and is removing them from the area between house-roof, or house-wall, and street.

The story is interesting:

Obviously, telephone men need not be reminded, in discussing first of all the need of this new order of things, of the rapid spread of the subterranean telephone work in every community where it has been installed at all.

In Cincinnati the telephone engineers, headed by T. S. Reed, who gives us our information as to this novel service, found the system so very advantageous that, from the outset, they have been improving upon it until now they have reached what they believe to be the last word in work of this specific sort.

'Round about Cincinnati they are installing what is known thereabouts as the direct house-connecting system. Put very briefly, the work involved in this installation is almost identical with that employed in the city's gas distribution service. Wherever a great gas company, operating what is substantially a monopoly of local service, installs some innovation it may be taken for granted that, viewed from the mere dollar and cents standpoint, such innovation *pays!*

In the matter of the telephone company, the new service *pays,* not simply as an economy measure, but, more than this, it is the much-sought-for answer to the growing cry of civic organization of every size and sort against the increasing masses of telephone wires along suburban streets and sometimes squarely before apartment-house dwellers' windows and doors.

The telephone expert need not be reminded of the innumerable plans for underground wiring attempted in various quarters from time to time. Reproduced among the abrupt hills and on the longer slopes so superabundant in residential Cincinnati, none of these plans possessed the inherent possibilities of affording as good a service to the subscriber as he had been receiving from the overhead lines, to say nothing of a better service, warranting the expenditure this must involve.

It was not until the later '90s, it will be remembered, that the vitrified-tile duct, now so common with many systems, was introduced. The original tiles, there are many who recall, were arranged to carry a number of cables placed one on top of the other. These seemed to the telephone engineer a big step in progress; but the end was not yet at hand.

It is interesting, in connection with this last word in the changes rung, to review the old, familiar, and perhaps long unthought-of story in detail:

The problem of underground-wire service first appeared to have been definitely solved forever and aye when the individual duct, containing a single cable, was produced. A number of these ducts were imbedded in concrete or cement beds placed at the base of trenches dug to far beneath the earth's surface. These ducts were made accessible, for repairs and the like, by manholes at convenient points. This innovation is regarded by most of the present-day authorities as the start of the present underground-subway service.

About 1892 the underground system came to Cincinnati. Branch laterals were constructed into the several alleys and distributing ring-poles were then put into such positions that subscribers in each block could be connected from them. This service naturally necessitated the use of the house-tops, upon which fixtures had to be placed, and so, quite obviously, private rights had to be invaded.

Hardly had this work been finished before the next revolutionary change succeeded. The introduction of common battery equipment made it imperative that the telephone engineers change the then current method entirely, substituting for it one insuring a higher insulation on the line. They accomplished this by securing rights of way from the owners of the large office buildings and running their cables directly into the cellars, from which points distribution continued over the branch cables sent throughout the building from these basic points.

This innovation reduced the number of wires leaving the terminal poles to a very great extent; but it left the smaller buildings still to be taken care of. The subscriber public of Cincinnati, for a very large part, did not keep itself unaware of the big change made. So satisfactory did it deem the experiment of going into the larger buildings in this way that before very long owners of innumerable smaller buildings asked that their wiring be taken care of in the same way.

Investigating costs and probable results, the company resolved on the change. Various methods were discussed. The eventual decision implied adopting a plan by which two or more laterals are run into each side of the block. Cables are then run from the point where the lateral enters the building, in the basement, along the basement wall and through the division walls into the various smaller buildings about. The object of making the two or more incisions in the side of the block was, of course, to preserve

Streets Are Crossed Before New Pavement Is Laid.

service in the event of fire, or where buildings had been destroyed by a tornado or other holocaust. In other words, the change should make the system so flexible that it would not be possible to interfere with the service by any but deliberate means.

Upon the completion of this monumental work, the terminal and ring poles were eliminated from the neighborhood where the system had been installed in its entirety, and the subscriber was easily connected direct from his instrument to the operator without the need of any overhead wires.

The work was done first in the actual "city bowl," the more congested district; then on many of the hilltops where there are areas devoted to the commercial needs of the territory around.

Meanwhile, the spread of the residential district of Cincinnati to more and still more outlying hilltops was presenting first a new problem, then a new phase of the other problem to the telephone engineers. Aerial leads became so heavy that the home-builders often suggested that they were looking through a screen at the suburb beautiful they had come in search of. In order to meet this complaint, the telephone company adopted first of all, the use of the aerial cable. But in a very short time the aerial cables became almost as numerous as the wires had been before. It was evident that there could be but one answer to the new problem. The underground subway must be brought into the suburban districts as well.

To the telephone engineers of many other cities the word that their company contemplated such an action would have

Underground Conduit Is Placed in the Parkways Along the Sidewalks.

produced almost no flurry whatever. The problems confronting them would have been comparatively simple. In Cincinnati, however, the modern subdivisions, the new real estate tracts, are entirely de-

Sometimes Poles Are Used as Trellises.

void of alleys. This condition necessitated the placing of terminal poles in the streets. From these the various subscribers received distribution over the limited area in each case involved. As the territory built up then, the wires and poles became more and more conspicuous and the subway service lost much of its original effectiveness.

Again a new problem was pressing—how to entirely eliminate the poles and the wires from the streets. Again several plans were suggested. Engineers investigated the methods employed in other cities.

The first method to be employed as a result of these studies was the placing of poles on private property. This was abandoned very quickly because of the innumerable rights of way difficulties which arose. It became necessary that a better means of ingress and of egress be secured.

Here the old and the newer means of distribution came to a parting of the ways. Heroic treatment alone could prevail. The plan employed consisted of connecting each house directly with the subway concerned by means of underground service.

The first strip of the sort attempted served its purpose so well that today all the underground subways in course of construction are being built after this method. So, too, all existing subways are being reconstructed as rapidly as it is humanly possible, in order to conform with the new plan.

The definite conclusions as to just what this new order of things should comprise were not reached quite as rapidly as the summary of the facts here might seem to indicate.

First, Mr. Reed tells us, an independent duct was run from the manhole in the street to every house involved. The cost of this made the system next to prohibitive and it had to be abandoned. After considerable more experiment, it was found that it was possible to use one duct to connect 10 homes. This, moreover, was found to reduce the cost to such an extent as to make the plan most practical.

The real secret of the success of this plan was the development of a Y branch. This is placed in one of the ducts in the main subway at standard distances from its neighbors, and laterals are then extended from it to the property line. Another Y branch is placed at the property line from which the lateral is extended to the adjoining house, either jointly or individually then, as the tenant may desire.

The company constructs the subway and the lateral up to and including the Y-point at the property line. From that point to the house a small charge is made for the final connection.

This plan is now being carried out on all new streets and in new subdivisions, where lots are being opened for sale; on all old streets, which are being rebuilt or resurfaced; and on such streets as are being improved for the first time, as well as on all old streets where increased business makes it necessary to install subways. The small charge made for this construction, it is honestly felt, represents value received by the subscriber paying. One advantage gained is that the business man can talk from his home to his office in any kind of weather and receives service which simply cannot be interrupted.

Originally, with this work, the engineers in charge found some small difficulties in certain quarters in getting property-owners to meet the company's efforts in wiping out overhead construction. When shown the neat appearance of a suburban square nearby, where such work had been completed, however, such objection almost invariably disappeared.

People, Cincinnati over, have now come to realize that with the subscribers and the telephone company working in harmony, the community at large becomes benefited, through a return to a clear skyline first of all. Suburban vistas become very much as Nature wished them to be and as they were before the telephone came; and the visitor from abroad, who is all alive to civic beauty, compliments the city for its countless highways and even byways, utterly devoid of wires and unsightly poles.

The telephone experts of Cincinnati give many interesting minor vignettes of this new order of things in vogue here. People of the locality, they suggest, are wont to speak of the telephone wires as being put in "under the street." This is not quite correct.

In the finer residential districts, where the sidewalks are often ten feet across, one meets a strip of sward two and a half feet wide separating the walk from the curbstone. Offsetting this, on the inner side of that walk, is another two-and-a-half foot stretch of lawn, extending to what is known as the property line. This is an unmarked bound, close to which there usually rises the low slope of the owner's lawn—sometimes quite gently, sometimes abruptly.

Sometimes, of course, sidewalks are not nearly as broad as the ones suggested. In newly-created subdivisions of Cincinnati the ordinances now prescribe that the actual property-line shall begin at a point 10 feet in from the curb of the street; and since folks like a bit of grass between curb and walk and must balance this with a similar strip on the inner side of that walk, the dimensions may not always be as large for those grassed-over plots as has been given. However, those plots invariably suffice for the company's ends.

Beneath the innermost of them, beneath the strip of sod between the inner side of the walk and the actual property line, the men proceed to work, laying their tunnels in such a way that their tops will be at least 24 inches beneath the surface.

In Cincinnati's Newer Suburbs Telephone Poles Are No Longer Found.

Laying a bit of a tunnel, a diminutive subway, down the length of a residential street doesn't seem much of an undertaking to mention, of course. Where streets are very long—and there are many such streets in Cincinnati—the subway laid

must be equally long. There is one continuous subway extending from the very heart of Cincinnati to Glendale, an adjacent village, which proceeds for 18 miles without a break. Incidentally, this subway is built in what is very nearly a mathematically exact line.

The clay conduits which are placed in these subways are of one of two types, the single-unit conduits or the multiple units.

On most of the main lines the four-duct conduit is employed. The one-duct conduit is reserved almost exclusively for points where the line is to be taken to some particular house. A cable containing upward of 1,200 wires is drawn through each of the ducts.

The construction gangs employed for the work of installing this cable consist of 25 men at least. Upon arriving at the site of their labors, the men stretch burlap all about in order to protect the grass while they are at work.

Then they proceed to open their subway. Improved streets are obviously far more difficult sites for such work than unimproved streets. Ordinary pick and shovel work is resorted to in digging the basic trenches. Out in remoter suburbs, where the digging is good, a squad of 25 will do a mile of the work in less than 20 days.

In the more populous suburbs and beside better improved thoroughfares the same task may require 35 days. Where the men come upon a bed of rock a mile of subway work may take them longer still.

The actual trench completed, a bed of concrete often as deep as three inches is laid upon its bottom. According to the

Concrete Is Placed Over the Conduit.

weather, this may be given as long as five hours in which to set.

Sufficiently dry for the advance of the work, the conduits, brought to the street side meanwhile, are put into place on the bed. The sections of conduit now employed in the Cincinnati area measure three feet in length.

As many as 100 conduits will neighbor one another in a trench. Each of the hundred will ultimately have a full-size cable drawn through each of its ducts.

The work, it is instantly manifest to all who may but come and see, is being done to stay—to last. Mr. Reed tells us that where conduits are being put down in this way the company is laying down work for 20 years ahead at least.

Individual conduits are cemented together thoroughly. Finally, a three-inch layer of concrete is spread over the top. Over this surface layer the native earth is filled and rammed; then the sod is returned to its place, and by and by, as this freshens and starts, the site appears, to those who knew it of old, exactly as it was before.

Care is taken, in fact, that this should be so. The telephone company realizes that its subscribers are concerned on every hand. As a result, in taking up the sod for the initial work it was cut into strips and watered to make it instantly available for returning to this place. While cut and stacked it is sprinkled every day. Company employes water it when it is back once more and bend every effort to bring it to look exactly like the neighbor grass of the yards around.

Every three hundred feet of the way, where street lengths so permit, a conduit is constructed, thus permitting access to the nearby subway ends.

Upon being questioned as to advantages in the new order of things, as compared with the old, Mr. Reed assured us that his company was not replacing the poles with conduits simply for the sake of city beautiful. There are more utilitarian reasons than this, he said, for the passing of the wooden pole in Cincinnati.

A high grade wooden pole, it was found, lasted in the Cincinnati climate with its varied changes at the utmost 15 years. Conduits, on the other hand, would last indefinitely.

Upon a typical mile of telephone highway the Cincinnati company estimates that it should have at least 40 wooden poles. These poles would cost at least $30 each, inclusive of their equipment, the cost of setting them into position, etc., making a total cost of $1,200 for the poles in the line. Conduits cost $1.50 a running foot, laid, ready for wiring and use; or $7,500 a mile.

There are interesting little sidelights to the work of installing the new system. Proceeding upon its way, the company's squad stops at each house and tries to obtain the owner's permission to carry on the digging. Sometimes people refuse absolutely. Then the company bides its time until, as a result of the new work done, they take down the poles. It then advises the party in question that it must remove his telephone as it can no longer give him service. The courts have held that it need not maintain that second older service in addition to the new.

Where the company does make the cutting, it charges the patron 30 cents a foot

It Has Seen Its Best Days in Cincinnati.

for its work from the property line to his house, irrespective of the distance this may mean. The public utility commission has held that it is entitled to this fee.

At the present time there are 1,519 miles of conduits in use in Cincinnati. Just the private property service lines placed in a series would total 87 miles.

Naturally a giant forest of poles has been removed as a result of these labors. They are taken down; the tops and the bottoms are cut off and the remainder of the pole is sent to the rural districts or other places in which poles are still being used.

It is hardly necessary to state that the company's men take care to fill the holes left by the departed poles and place sod over the earth. Sometimes the property owners plant shrubs on the site. It isn't very long, in either case, before every trace of the pole has been removed and it is but a memory.

Once in a great while someone will recall the day when telephone wires traversed the air lanes high above the tree-tops in the Cincinnati area. They will remind themselves that there was a time when poles used to support these wires which ran from the poles to the houses at either side. Then a newer, better way of doing things came into vogue and the poles were removed; the holes left behind were filled, and the grass set to cover the site.

A second thought or two of those halcyon days, and then the poles are once more forgotten. They came; they served the city well; they will have gone. In their wake there will be but a memory, and this too, in its course, Father Time will erase.

Report on Inductive Interference

Sub-committee of Joint General Committee of National Electric Light Association and Bell Companies Reports Basis for Handling Inductive Interference Problem Between Light and Power and The Bell Companies

The joint general committee of the National Electric Light Association and the Bell telephone system is sending out a report of its sub-committee, which is recommended as a basis for the handling of the inductive interference problem between electric light and power companies and telephone companies. A sub-committee, consisting of M. R. Burt, R. F. Pack and Bancroft Gherardi, has been instructed to proceed with the further work as recommended under the section devoted to standards of construction and operation and to report before May 15.

The general committee, as soon as standards of construction and operation are adopted, will consider whether principles can be established to aid in the fair allocation of the costs of co-ordinate measures. In the meantime, the committee believes that with the co-operative spirit which now is evident a mutually equitable adjustment can and should be made in each specific case. It is understood that any adjustments made will not be considered as precedents by either party to the prejudice of future understandings.

The sub-committee report, which is signed by R. F. Pack, representing the N. E. L. A., and Bancroft Gherardi, representing the Bell telephone system, follows:

"A committee of engineers was brought together consisting of H. P. Charlesworth, S. P. Grace, H. S. Osborne and H. S. Warren for the Bell telephone system, and W. J. Canada, A. E. Silver and F. H. Lane for the National Electric Light Association. This group of engineers proceeded, under our direction, to hold a series of meetings (in conformity with a memorandum prepared by us and attached hereto) for the purpose of (1) analyzing the situation to determine the extent to which standards of practice and construction exist which are mutually acceptable, and (2) setting forth certain principles of procedure for the treatment of those situations of proximity for which such standards have not been mutually acceptable.

In accordance with your instructions the question of allocation of cost of co-ordinative measures has not been discussed.

Your sub-committee has gone over the results of this work carefully and now presents this initial report outlining certain recommended principles and standards. These apply generally to future construction but may be employed as occasion requires in clearing up existing situations.

As an essential step in promoting conformity with these recommended standards and principles, an arrangement should be set up between the respective utilities providing for the interchange of pertinent data and information relative to proposed and existing construction and changes in operating conditions concerned in situations of proximity.

IMPORTANCE OF SYMPATHY

As a rule, men who have had a hard time, who have known what it is to suffer and to want, have a keener understanding of what life means. They have more feeling for the other fellow and more sympathy.

The foundations of life, and business is only a part of life, are built on humanity and sympathy. Not soft, impractical sentiment; but sentiment of fineness and understanding without which there is no achievement.—Samuel McRoberts, president, Metropolitan Trust Co.

CLASSIFICATION OF SITUATIONS OF PROXIMITY: Existing standards acceptable to both utilities are available covering the situations arising out of crossings, conflicting construction and jointly occupied poles. As to the question of parallel construction, standards acceptable to both utilities are not yet available but certain general principles of procedure have been agreed upon and a program is recommended with a view to the early development of mutually satisfactory standards.

CROSSINGS: The National Electrical Safety Code provides an acceptable guide to practice.

CONFLICTS: By 'conflicts' are meant situations where two separate pole lines parallel each other in close proximity under conditions more specifically defined in the National Electrical Safety Code. The National Electrical Safety Code provides an acceptable guide to practice. The safety code does not include the subject of inductive interference in its scope.

As far as inductive co-ordination of circuits is concerned, the principles recommended below under 'Parallel Construction Generally' may be considered as applying to 'Conflicts' and 'Jointly-Occupied Poles.'

JOINTLY-OCCUPIED POLES: There are very substantial advantages to both utilities in the employment of jointly-occupied poles where the conditions and character of the circuits permit. The joint use of poles by supply and signal circuits is generally preferable to separate lines when justified by considerations of safety, economy and convenience and presuming satisfactory agreement between the parties concerned as to terms and conditions.

The preferences and construction requirements of the National Electrical Safety Code for joint use between supply and signal circuits are tentatively accepted. In order to reach a final understanding, particularly with regard to the question of joint use involving certain types of circuits, your committee finds that further consideration is necessary.

PARALLEL CONSTRUCTION GENERALLY: The problem of inductive interference requires the combined consideration of both power and communication utilities because it arises from contributing characteristics of both systems and their physical relations. The situations encountered include parallel lines, whether on separate or jointly-used poles.

In approaching the solution of this problem it is recognized that the public interest is paramount and that the power and communication utilities must be able to render service to the public in an economical and efficient manner, and that for this purpose both have been granted rights to use highways, and that they must utilize the highways to serve their customers properly with plants so laid out as to be readily accessible and easily operated and maintained.

The power utilities, thoroughly recognizing the desirability of co-ordination, state that as necessity requires and in order to serve their customers they have the right and the duty to the public to place an electric light or power line of any type on a highway, provided that the location and the type of construction are such as reasonably to co-ordinate with similarly co-ordinated lines owned or operated by the communication utilities, and that they cannot be restricted from serving their customers in a reasonably economical and satisfactory manner because of the presence of communication circuits on the highways involved.

The communication utilities, thoroughly recognizing the desirability of co-ordination, state as their position, that it is their right to have their service, when rendered over properly-constructed lines, free from impairment caused by either (1) subsequently constructed parallel supply lines or (2) existing supply lines by reason of subsequent changes in such lines or their operation, including in either case, as far as practicable, impairment caused by transient operating conditions on such supply lines.

In cases of parallel construction on highways such that impairment cannot be avoided at the proposed separation by available co-ordinative measures, the communication utilities believe they not only have the right but it is their duty to the telephone-using public to require that some plan, including separation adequate to prevent impairment, be employed.

While neither party hereto subscribes to the statement of position of the other party or relinquishes any of the rights claimed by it, the desire of both parties is to co-operate for the purpose of avoiding controversies which might arise out of their differences as to their relative rights, and we, therefore, recommend that they proceed along the following general plan, which plan it is confidently believed will enable both parties to meet their service requirements in a satisfactory manner and at the same time leave unimpaired all of the rights claimed by the other party:

Recommended Plan for Solution of Inductive Interference Situations.

I. General Principles:

A. Co-operative planning for all new construction.

B. The location, construction and operation of all supply and signal circuits in conformity with generally co-ordinated methods, including precautionary measures which can reasonably be applied under generally prevailing conditions as distinguished from special situations.

C. Where specific co-ordinative measures are necessary, those providing the best engineering solution should be applied. This involves: (1) Meeting service requirements of both systems; (2) the co-ordinative measures applied shall be selected without regard to whether they apply to one system or the other or both; (3) the solution to be based as far as practicable on the state of the art at that time; (4) measures of co-ordination wholly by separation should be considered with other measures of co-ordination where the former will not sacrifice economy and practicability and the convenience of rendering present and future service.

D. Neither party should assume to be the judge of the service requirements of the other system, or of what constitutes good practice in that system.

E. Existing cases to be cleared up in an orderly and systematic way as occasion requires in accordance with the above principles.

II. Standards of Construction and Operation in Accord with the Foregoing Principles:

A. Adoption of more detailed principles as soon as possible for temporary use.

B. Preparation by further co-operative work, based on the existing state of the art, of definite standards covering all classes of inductive exposures.

III. Development Work:

As soon as it can be done without interfering with the work recommended under II above, a co-operative study of the art shall be made in order to determine what practicable measures, if any, may be developed and adopted to lessen the contributing characteristics of both systems.

Conclusions.

Your sub-committee believes that great progress has been made toward the solution of the problems arising out of the proximity of supply and signal circuits and to further promote the satisfactory working out of these situations recommends as follows:

1. That the joint committee, if it approve, adopt the principles and standards herein set forth and recommend them for general use by the respective utilities.

2. That special emphasis be given to the importance of working out problems of interference before definite plans are made for construction, both with regard to immediate extensions and to general plans for future development.

3. That when differences do arise, every effort be made to arrive at a settlement through negotiations rather than resorting to court or commission proceedings.

4. That arrangements be made for proceeding with further co-operative studies along the lines indicated herein."

Summaries of Reports of Class A Companies for December.

The December, 1921, summary of the reports of revenues and expenses of 67 Class A telephone companies, as compiled by the Bureau of Statistics of the Interstate Commerce Commission, is presented on this page.

A decrease of 5.5 per cent in traffic expenses, compared with those for the same month of 1920, is shown on the report. The expenses represented 76.67 per cent of the revenues in December, 1921, while in December, 1920, the expenses were 76.59 per cent of the revenues. The ratio of expenses to revenues for the 12 months ending with December was 72.96 in 1921 and 76.77 in 1920.

The instruments in use December 31, 1921 totaled 9,777,331, an increase of 5.2 per cent over December 31, 1920, at which time there were 9,293,786 stations in service. This gain is below the average for other years, due probably to the general depression.

Item.	For the month of December				For the twelve mos. ending with December			
	1921.	1920.	Increase or decrease (*). Amount.	Ratio, Pct.	1921.	1920.	Increase or decrease (*). Amount.	Ratio, Pct.
Number of company stations in service at end of month	9,777,331	9,293,786	483,545	5.2	.....	.....	.....	....
Revenues:								
Subscribers' station revenues	$29,785,952	$27,291,565	$2,494,387	9.1	$347,769,197	$304,487,044	$43,282,153	14.2
Public pay station revenues	2,187,695	2,090,001	97,694	4.7	24,344,499	23,219,224	1,125,275	4.8
Miscellaneous exchange service revenues	435,289	418,266	17,023	4.1	5,008,580	4,583,411	425,169	9.3
Message tolls	11,801,182	11,274,122	527,060	4.7	138,455,996	135,148,395	3,307,601	2.4
Miscellaneous toll line revenues	1,373,710	1,273,050	100,660	7.9	15,605,897	14,448,848	1,157,049	8.0
Sundry miscellaneous revenues	799,755	816,436	*16,681	*2.0	8,406,346	7,049,617	1,356,729	19.2
Licensee revenue—Cr.	1,740,282	1,593,177	147,105	9.2	20,098,395	17,777,679	2,320,716	13.1
Licensee revenue—Dr.	1,739,249	1,591,923	147,326	9.3	20,085,105	17,770,937	2,314,168	13.0
Telephone operating revenues	$46,384,616	$43,164,694	$3,219,922	7.5	$539,603,805	$488,943,281	$50,660,524	10.4
Expenses:								
Depreciation of plant and equipment	$ 6,802,778	$ 5,151,299	$1,651,479	32.1	$ 76,794,984	$ 71,142,429	$ 5,652,555	7.9
All other maintenance	6,799,807	6,888,034	*88,227	*1.3	30,805,287	77,146,996	3,658,291	4.7
Traffic expenses	13,510,055	14,296,779	*786,724	*5.5	158,487,564	155,772,812	2,714,752	1.7
Commercial expenses	4,531,106	4,369,149	161,957	3.7	51,624,571	48,525,607	3,098,964	6.4
General and miscellaneous expenses	3,918,905	2,355,300	1,563,605	66.4	25,971,383	22,784,520	3,186,863	14.0
Telephone operating expenses	$35,562,651	$33,060,561	$2,502,090	7.6	$393,683,789	$375,372,364	$18,311,425	4.9
Net telephone operating revenues	$10,821,965	$10,104,133	$ 717,832	7.1	$145,920,016	$113,570,917	$32,349,099	28.5
Other operating revenues	$ 1,219	$ 4,631	*$ 3,412	*73.7	$ 44,291	$ 60,981	*$ 16,690	*27.4
Other operating expenses	2,039	4,882	*2,843	*58.3	30,904	44,813	*13,909	*31.0
Uncollectible operating revenues	345,436	74,812	270,624	361.7	2,212,771	1,518,110	694,661	45.8
Operating income before deducting taxes	10,475,709	10,029,070	446,639	4.5	143,720,632	112,068,975	31,651,657	28.2
Taxes assignable to operations	2,876,910	2,562,738	314,172	12.3	37,256,181	30,276,231	6,979,950	23.1
Operating income	$ 7,598,799	$ 7,466,332	$ 132,467	1.8	$106,464,451	$ 81,792,744	$24,671,707	30.2
Ratio of expenses to revenues, per cent	76.67	76.59	.08	.1	72.96	76.77	*3.81	*5.0

Statistics of Operations for December, 1921 — for Entire Year of Class A Telephone Companies, Compiled by Interstate Commission.

The Building Up of the Bell System

Interesting Sidelights on Telephone's Technical Development by Bell Engineers and Scientists Given by Vice-President John J. Carty, in Hearing in New York State-wide Case—Hints of Future Developments of the Art

Radio telephony will supplement but will not supplant the wires as a general means of intercommunication, and the present telephone system of the United States will always be the backbone of voice-to-voice communication, Brigadier General John J. Carty, a vice-president of the American Telephone & Telegraph Co., declared at Albany, N. Y., March 15, in the hearing before the New York Public Service Commission on state-wide affairs of the New York Telephone Co. General Carty, who has been associated with the telephone industry since its infancy, became a witness in this investigation to give testimony on the relationship between the New York Telephone Co. and the American Telephone & Telegraph Co.

Attorney-General Charles D. Newton made his first appearance in the telephone inquiry, as directed by a law recently passed at Governor Miller's suggestion. He announced that he would give his personal attention to those proceedings and would be assisted by First Deputy Thomas F. Fennell of Elmira, a former member of the commission.

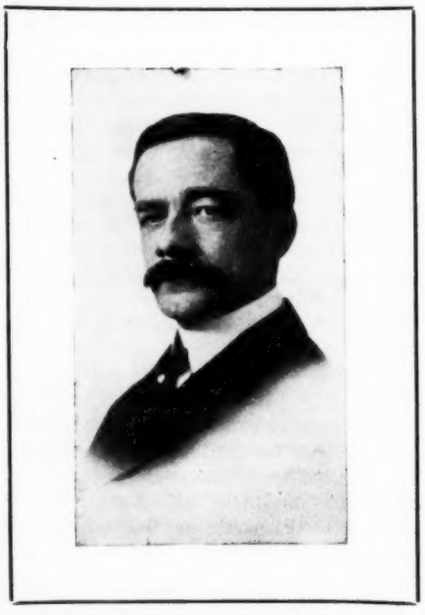
"The field for radio is limited," General Carty said, "to broadcasting communicating with ships at sea, communication between airships and numerous other special services, both military and civil. There are too many limitations, such as the small number of channels for communication, the lack of secrecy and the presence of atmospheric disturbances, for it ever to be used wholly for voice-to-voice communication, but it has a remarkable usefulness in its own peculiar field."

This information was brought out in connection with General Carty's recountal of the vast amount of experimental and research work conducted by the American Telephone & Telegraph Co. on behalf of its associated companies to seek improvement in the telephone art. These experiments prove conclusively, he said, that for private voice-to-voice communication the physical telephone system, rather than the ether, must be used.

The witness gave, during the course of several hours of almost continual recital, a faint picture of the development of the telephone industry, from the time Alexander Graham Bell perfected the first transmitter. In front of the witness was one of the original telephones.

Speaking in moderate tones and with a treasure house of experience as his background, he traced each important step from the invention of that first crude instrument down through the successful stages of switchboard development, the perfection of underground cables, the revolutionary changes in the type of telephone instruments used, and the building of the transcontinental telephone line from New York to San Francisco to the forthcoming use of the machine switching or automatic telephone system in New York City.

"If we did not continue this work," General Carty said, "telephone progress would cease and conditions would be as bad as they are abroad. We know that we must soon be able to talk to South America; we are already talking to Cuba, and we know we can talk to London. We are now working on inventions which may not be used for five or ten years, but we know that when these things are perfected they will improve the service, for we don't undertake any research work unless we are reasonably sure that improvement in the service will result."



Brigadier General Carty Related a Most Fascinating Story of Telephone Progress and of Future Probabilities.

General Carty said his telephone career began more than 40 years ago as an operator in the Boston central office where he helped the telephone pioneers, Bell and Watson, in their early experiments. He first started as an operator in 1879; no one except Mr. Bell knew very much about the telephone and it took years of hard labor to get persons throughout the country interested in entering the business in the various localities.

"Why, the telephone in those days," smiled the witness, "was considered a business nuisance."

He assisted in the development of the first full metallic circuit which took the place of the noisy "grounded circuit" and later opened the way for long distance telephone lines. The vicissitudes of the pioneers were many, he declared, because the public looked on the telephone as a scientific toy and investors were afraid to speculate in the telephone business.

One by one, however, individuals were interested in taking out licenses for various localities until the principal cities of the country had local telephone systems. From these local licenses, he said, the present Bell system of associated companies had grown. The early licensees were helped in their financial, legal and technical problems by the original Bell company which was then the nucleus of the present American Telephone & Telegraph Co. which continues to render the same service, although of greater magnitude to the associated companies of today.

His story of cable development which has made possible the large central office switchboards of today was especially interesting as the evolution of the modern switchboard.

"Our development of cable has not stopped," the witness continued, "for we are now working on long toll cables, and hope within a few years to have telephone systems in the East "blizzard proof."

Fifteen years of study, the witness went on, has brought about the machine switching system soon to be inaugurated in New York City. More than two hundred highly-skilled engineers and scientists in his department, General Carty said, were continually studying all phases of telephone development with the sole idea of improving the service.

The witness gave a history of radio telephony development, beginning with the first experiments carried on under his direction in 1914, when speech was transmitted through the ether for ten miles, although only faintly. In describing the talk from New York to the Eiffel Tower in Paris in 1915, General Carty said, "a telephone engineer in Honolulu was able to hear the whole conversation."

"We think that was the first broadcasting," he said with a smile.

Radio conversation between New York and London is possible only at certain seasons of the year, he said, because of the expensive apparatus involved, the lack of secrecy and because it is a seasonable project. Commercial service in this respect is not feasible at present.

All patents owned and controlled by the American Telephone & Telegraph Co.—and there are over 4,100 of them covering all phases of the telephone industry—are available to licensee companies of the system, such as the New York Telephone Co., he said. Cable developments perfected by the American Telephone & Telegraph Co. have resulted in a saving of $115,000,000 to the Bell system, and the purchase of the patent rights is the smallest part of development and research, he added.

Questioned as to the engineering department of the New York Telephone Co., General Carty said this department was engaged in construction, maintenance and operating matters and was not equipped to carry on research and development work.

"The smallest expense in patents," he said, "is the original purchase of them from the patentee. Then comes the work of our engineers to develop and perfect them."

It was brought out that the New York Telephone Co. pays to the American Telephone & Telegraph Co. about 22 cents per month on each of the 1,422,000 telephones in New York state. In return for this, the telephone company not only receives the instruments but the full benefit of the patents and research work of the American Telephone & Telegraph Co., as well as any financial support that might be necessary.

After General Carty had concluded his testimony, F. L. Rhodes, one of his assistants in the American Telephone & Telegraph Co., took the stand for a short time to testify on specific services rendered by the American Telephone & Telegraph Co. to the New York Telephone Co.

At this point, Deputy Attorney General Fennell and Assistant Corporation Counsel M. M. Fertig, of New York, inquired whether testimony would be introduced to show the cost to the American Telephone & Telegraph Co. of this service rendered. E. S. Wilson, attorney for the telephone company, said witnesses would be produced to evaluate the services to the New York Telephone Co. Chairman Prendergast said the commission would defer a ruling on this question until after the telephone company had presented its testimony on the question of value.

On March 16, F. L. Rhodes continued his outline of specific services, while Sergius P. Grace, a consulting engineer of the New York Telephone Co., told how the latter company used the services and what benefits resulted in saving in operating costs and capital investments.

Based on engineering study, Mr. Grace produced figures to show that under the license agreement the use of loading coils, fine wire cables, duplex cables and "phantom circuits" on open wires has saved the New York Telephone Co. more than $67,000,000 in capital savings since these advances in the art were perfected a few years ago.

Mr. Grace also declared that the New York Telephone Co. received the use of vital parts of the telephone instrument which are furnished by the American Telephone & Telegraph Co. If the New York Telephone Co. were required to buy these parts, Mr. Grace said, the cost for providing instruments for the estimated average number of telephones in use in New York state in 1922 would be at least $1,750,000 yearly.

SATISFACTION

By Miss Anne Barnes.

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa.

Did you ever go into a millinery store, wanting a hat badly and needing it worse, and have a saleslady approach you in the most endearing terms? (I am talking to telephone operators.) I have often wondered why some saleslades do that.

Today I had an experience of this kind—and I did not get a hat. The saleslady met me with a smile, and a caress in her voice. Instantly I was on my guard, because I realized that this eyebrowless young woman with her flow of blarney was going to make me look like a comic valentine if I permitted her to bedeck my head with some of the freaks of millinery fancy—her idea of style.

Her intention was selling a hat—at the expense of satisfaction, if necessary. Selling hats was her business, just as answering telephone calls is the business of the telephone operator—but the *real* saleslady, whether a milliner or a telephone operator, must *also sell satisfaction.*

General Squier Sues Bell for Radio Patent Infringement.

Major General George O. Squier, chief signal officer of the army, and recognized by American and foreign scientific organizations as an authority on radiotelegraphy, announced March 15 that he had filed suit in the United States District Court for the Southern District of New York against the American Telephone & Telegraph Co., charging infringement of several patents he holds for wireless devices.

The suit was described as likely to become one of first importance to the wireless industry, since the patents claimed by General Squier to have been infringed upon are those covering devices which, the patent office held, permit radio communications to be "guided" through the air instead of being broadcasted promiscuously, and furthermore enable the sender to transmit many telephone and telegraph messages simultaneously over one wire.

The First Telephone Conversation Over Long Distance.

"Is that you, Professor? This is Gower talking. I am going to bark like a dog.

"Do you hear me now? I will try it again. Now do you hear? 'Bow-wow-wow! Bow-wow!' You got that all right?

"I am going to meow like a cat," and he did.

"I am going to baa like a sheep," and he did.

Such, according to Charles E. Lincoln, in Long Lines, the monthly magazine of the Long Lines Department, American Telephone & Telegraph Co., was one end of the first long distance telephone conversation ever held. It is said to have taken place in 1877 between Fred Gower, editorial writer on the Providence Press and Star, and Professor Bell in Boston.

In that year Lincoln—who is now connected with the Providence (R. I.) Journal—was covering local news for the Providence Dispatch. Being advised that unusual experiments were to be tried out in Providence the evening of March 31, he crept up the stairs to the A. & P. office and sat on the top step just outside the door, where he could remain without much danger of discovery.

Gower was talking as he began to listen. Other people in the room followed Gower at the instrument, and then, judging from the way the occupants were moving about that the meeting was breaking up, the eavesdropper left in the same sleuth-like manner that he came.

Report Wave Lengths for Amateur Radio Operators.

Recommendation that a wave length of from 150 to 275 meters be allocated to amateur wireless telephone operators; that the field between these limits be subdivided for various amateur classes, and that their status be fixed by law, was made in a report made public March 18 by the amateur committee of the government radio conference.

The report was supplementary to those of other committees which already have been published.

Sundry Snapshots Along the Trail

Observations and Comments, Pertinent and Otherwise, On the Sunshine and Shadows of Telephone Work

By Well Clay

Are you one of the kind whose peace of mind
Is often filched away?
Do you often crave what others have,
And let sorrow in to stay?

Do you lose your smile though friends beguile
And voices raise in song?
Why look so dour and feel so sour
With a face that's always long?

No words of cheer can reach your ear,
No sun your pathway light,
Until you chase the gloom and make some room
For cheer instead of blight.

If you are looking through smoked glasses all the time, it is better to throw them away, as eclipses of the sun are so far apart that it doesn't pay to be ready all the while.

Business depression is with us, of course, but it will soon pass away and other troubles will come to the fore—if you watch for them closely. There is always some trouble but there are always some cheerful conditons, too, if one can recognize them.

Up here in Minnesota we recently had some very bad storms of sleet and snow, and a good many wires and poles went down in some sections, badly hampering telephone traffic. The expense of the work of restoring service is great, but other lines of business have their troubles and losses, too.

If your merchant has to take a loss on invoicing goods in coming down from the higher prices which have prevailed in the past few years, you expect him to still be cheerful and a good loser. It will pay him to do so, as a cheerful merchant sells more goods than a gloomy one who goes

If You Are Looking Through Smoked Glasses All the Time, It Is Better to Throw Them Away.

down in his basement and sulks because he has had to take the consequences of his own short-sightedness in not preparing for the inevitable.

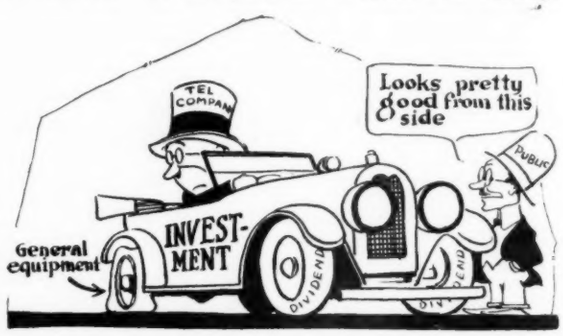
The farmer has been having his troubles, and the butcher, the baker and the candlestick-maker have all had theirs, especially the latter who has lost all the business he ever did have since gas and electricity put him on the skids. The loss may have been heavy, but it might have been worse.

Every telephone man in every climate has his own particular brand of trouble whether it's floods or snowdrifts, borers or sleet storms. It's always something. They all have their cheerful phases, too, whether they are in the frigid North or the salubrious South. How would you like to be a telephone lineman in Russia now?

If we can not travel by motor car, we can have the fun of sleigh riding, wrapped up in protecting furs and snuggled down in nice clean straw. Your appetite after a day in the cold, clear air of the north is certainly not the worst in the world. It is harder to climb poles, and fingers get cold at times in working at repairs which do not permit mittens or gloves, but on the whole it might be worse. You never have to get out and restore a flat tire in this kind of weather and the present stage of snow up here.

Speaking of flat tires, reminds me that I saw a telephone statement the other day that looked to me as if it had a flat tire. On the face of it there seemed to be nothing wrong with it, but on looking closer it developed that while they earned a good dividend on the capital stock outstanding as represented by issued shares, there was nothing earned to pay a dividend on the surplus which had accumulated for several years and which was without doubt in the form of general equipment, station equipment and central office equipment, as is generally the case with most telephone companies. Depreciation had been earned on plant and equipment of which this surplus represented a part, but nothing else.

If the surplus belongs to the stockholder, who has often allowed it to accumulate at the expense of dividends when money was scarce, then it seems to me that the stockholder should be allowed to earn dividends on the surplus as well as on the actual issued stock. Otherwise, there should be no surplus but all such accounts should be distributed in the form of stock dividends from time to time, if there be no other money available to finance growth and the company has to retain cash earnings instead of distributing them in the form of dividends.



If All the Rest of the Investment Is to Return a Dividend, Then Why Should One Tire Be Left Without Filling?

It looked to me like a flat tire on the machine which in every other respect was quite as it should be.

If we draw out our earnings in the form of dividends and then turn about and buy stock, there is no question that we would and should expect dividends on the money left with the telephone company. But if we do not go through the motions of drawing it out and reinvesting it, then are we to leave it there with no prospect of securing yearly returns on it? If all the rest of the investment is to return a dividend, then why should one tire be left without filling?

APHORISM: A flat tire delays the journey.

New York Concerns Give Wireless Reports to Customers.

The first wireless telephone station in the fur trade and, so far as known, the first in any of the apparel industries, was opened recently in New York City by Kaye & Einstein, manufacturing furriers.

The receiving apparatus of the station has been installed in a room adjacent to the show room. Connections have been made with the buyers' booths in the latter place, making it possible for the firm's customers to hear at will the stock market reports, crop and weather reports, news of the day and music that are sent out.

According to Irwin Heilbroner, head of the firm, an amplifier will be installed in the workrooms in a few days, by which the employes will be enabled to enjoy the daily noon hour concerts. The system installed is a special one built by Julius M. Breitenbach.

Depreciation of Telephone Plants

Part II. The Accumulation of Reserves for Accrued Depreciation—Average Expectation of Life in Service or Period in Service—Computation of Normal Depreciation Reserve of Component Parts and Total for Entire Property

By Cyrus G. Hill
J. G. Wray & Co., Chicago

In Part I of this article, we considered at some length the way in which shrinkage takes place in the capital invested in certain blocks or groups of telephone equipment. It was found that normally retirements begin shortly after the placing of new plant, being very small in amount during the first few years, and gradually increasing year by year until a maximum of retirements is reached, after which the quantity of plant retired gradually decreases year by year, until none of the original plant remains.

The Decrease in Investment.

The average life in service for a given class of plant usually falls near the point of maximum retirements, and the maximum age attained by the longest-lived units is about twice the average length of life. The decrease of the investment in plant placed in any year, due to subsequent retirements, is not, therefore, distributed uniformly over the life of that plant, but follows a characteristic life curve, examples of which were shown.

The most practical method of compensating for shrinkage in value, due to depreciation and ultimate retirement of plant units, is to set aside each year for depreciation, as part of the current operating expenses, such equal amounts as will accumulate during the average service life of the plant to a sum equal to the original investment, less the salvage.

The expense, or loss of capital, which is actually incurred in lump sums at the time of the withdrawal from service of the various items of plant is thus spread uniformly over the lives of those items. The difference between the non-uniform rate of retirement of fixed capital incident to removals of plant, and the uniform rate of accumulation of annual allowances for depreciation, results in building up reserves for accrued depreciation.

Since the reserve for accrued depreciation associated with a particular group of plant elements is intended to be exactly consumed by the cost of retirement (original cost of plant retired less net salvage) of that group, it follows that the balance in the reserve at any time, which will meet this requirement, is a definite and determinable amount.

In order to estimate the normal or required depreciation reserve for any class of property of a given telephone company, we must know the characteristic life curve, or the percentage of plant initially placed which will survive each year of age from one to the maximum, and the gross additions placed during a series of consecutive years in the immediate past.

By the "Normal Reserve for Accrued Depreciation," or the normal depreciation reserve, associated with certain property in service, is meant that amount of money which, together with future additions to this reserve would be just sufficient to meet the cost of retirement of the same property at the time of its removal.

The future additions or credits to the depreciation reserve depend upon the time elapsing before the retirement of each unit of property, and upon the annual rate of expense of depreciation in effect during the period. The cost of retirement of property depends upon the original cost of the property concerned, or upon the retirement unit cost which serves as an approximation to the original cost per unit of plant, upon the gross salvage which can be recovered, and the cost of removal.

Assuming all the elements affecting the depreciation reserve to remain constant with the exception of the annual expense allowed for depreciation, the present reserve required to meet future retirements will be comparatively small if the depreciation rate in effect is high, and the required reserve will be large if the depreciation rate is low.

Definite Annual Rate of Expense of Depreciation.

Since the component parts of a property have each a definite term of life in service, and among them an average length of life, it follows that there is, for that property, a definite annual rate of expense of depreciation which, if continued in effect throughout the life of the property, would make the total amounts set aside as expense of depreciation exactly equal the total realized depreciation, or cost of retirement of the entire property.

For the so-called straight line method of providing for depreciation, the depreciation rate, correct for a property of average life, A years, and salvage, S per cent of original cost of plant retired, is

$$R = (100 - S)/A$$

where R is the annual depreciation rate as a percentage of the book value of plant in service.

This amounts to dividing the "wearing value" (original cost less salvage) into as many equal parts as there are years in the average life of the property, and setting aside one of these parts each year in a reserve to take care of retirements as they occur.

The existing reserve for accrued depreciation is the sum of the annual amounts by which the expense of depreciation exceeded the realized depreciation each year in the past history of the company, including all readjustments, transfers, and other operations which affected this account on the company's books. The results of all annual depreciation rates in effect in past years are reflected in the existing depreciation reserve.

Unless otherwise specified, the normal reserve for accrued depreciation, representing present provision for future requirements, is based upon the assumption that the future rates for expense of depreciation will be correct, that retirements will actually occur as expected, and that the depreciation rates are derived from the correct average life.

The estimates of expected retirements are derived either from definite plans or programs laid down for the future, from records of past experience of similar groups of plant elements, or from combined consideration of both past and future.

Analysis of the records of plant placed and retired in a number of telephone properties has indicated that, for those classes of plant which are composed of an aggregate of a large number of homogeneous elements, the relations of the numbers of units of plant retired during each year of age to the total in service of that age, follow roughly a definite law of change or order of progression with advancing age. This law being known, and the maximum span of life for units having the longest period in service having been determined from the history of the plant or other considerations, it remains to find the average life, the correct annual rate of expense of depreciation, and therefrom the normal reserve for accrued depreciation.

The method can be explained best by means of a concrete example. For this purpose data applicable to substation apparatus in a large city will be used.

Average Expectation of Life or Period in Service.

Of 100 units placed in the plant simultaneously at a time designated as O, a

table, No. 4, shows the numbers of units retired during each succeeding year, and the numbers of units surviving the end of each year.

One method of arriving at the average life of substation apparatus is to add up

N Number of Years Elapsed	*D* Number of Retirements During the Year.	*L* Number of Units Surviving at End of Year.
0		100.00
1	0.93	99.07
2	2.12	96.95
3	4.19	92.76
4	7.09	85.67
5	10.59	75.08
6	13.58	61.50
7	15.19	46.31
8	14.60	31.71
9	12.20	19.51
10	8.86	10.65
11	5.59	5.06
12	3.04	2.02
13	1.43	0.59
14	0.59	0.00
Total	100.00	726.88

Table No. 4. Average Expectation of Life of Substation Apparatus.

the total number of years of service for all of the units and then divide by the number of units, thus obtaining the average number of years of service per unit of plant. Looking at column *L*, Table No. 4, it appears that 99.07 units survive an age of one year and contribute altogether 99.07 years of life; 96.95 units survive one more year of age and contribute an additional 96.95 years of life, making 196.02 years of life in all. The 92.76 units surviving the third year contribute 92.76 more years of life, and so on down the column.

By the time the 14th year is reached, where no more units survive, a total of 626.88 years of life will have been obtained. If we assume the 100 units to have been placed at the beginning of the first year and all retirements to be made at the ends of the succeeding years, then each of the units listed in column *D*, under retirements, contributes a year of life in addition to the years accumulated in column *L*.

One hundred years of life are thus contributed by the units of column *D*, and the total aggregate number of years of life in service for the 100 original units, placed at time *O*, at the beginning of year 1, is 726.88 years. The average life per unit is 1/100 of this or 7.3 years, approximately.

Two assumptions made in arriving at this average life of 7.3 years are at variance with the known facts:

First, if the 100 units under consideration are to be typical of the plant placed during any year, it will be preferable to assume that they were placed at uniformly spaced intervals throughout the year rather than to lump them all at the beginning of the first year.

Second, the assumption that each year's retirements occur at a uniform rate throughout the year is more reasonable than that retirements are made at the end of each year.

Under the first assumption, the 99.07 units shown as surviving the first year will contribute, on the average, one-half year of life each, or 49.53 years of life among them instead of 99.07 years, as previously stated.

Under the second assumption, the units retired during each year contribute an average addition of one-half year of life each instead of one year each, as stated above.

Approximately 50 years of life will, therefore, be contributed by the units listed in column *D*.

The aggregate years of life for the original 100 units is, then, approximately 627.36, giving an average life per unit of 6.3 years.

The average life can, therefore, be obtained, with the required accuracy, by summing the *L* column, or plant surviving each year, excluding year zero, and dividing by 100; or by summing the entire *L* column, dividing by 100, and subtracting one year. Thus in the case of substation apparatus,

Average life = 7.3 — 1 = 6.3 years.

Normal Depreciation Reserve.

By definition the normal depreciation reserve is equal to the cost of retirement of the property less the accumulated annual expense of depreciation credited to reserve for accrued depreciation during the life of the property. As a convenient notation let:

A = Average life of plant in place.

S = Salvage as percentage of original cost of plant retired.

N = Number of years elapsed since the plant was placed.

L_n = Plant surviving year N as a percentage of the total plant placed.

Then L_0 = Total plant placed; L_1 = Percentage of plant surviving the first year; L_2 = Percentage of plant surviving the second year; L_3, the third year; etc.

The summation of a column of figures will be denoted thus: $(L_n + \ldots + L_o)$ = the sum of the L column from year N to year O inclusive.

For the sake of simplicity we will first assume all plant is placed at the beginning and retired at the end of the year, and then correct the result to conform to the assumption of uniform distribution of placements and retirements throughout the year.

For average life we have $A = A^1 - 1$.

where $A^1 = \frac{1}{100}(L_o + \ldots\ldots + L_{14}) =$ average life, under the first assumptions.

The annual depreciation rate in per cent is $(100 - S)/A^1$.

The expense of depreciation in any year N will be equal to the annual depreciation rate multiplied by the plant surviving in that year, or

$$\text{Expense of depreciation (yr. } N) = \left(\frac{100 - S}{A^1}\right) L_{(n-1)}$$

The accumulated expense of depreciation from the end of year N to the retirement of the last surviving plant in year 14 will be:

$$\left(\frac{100 - S}{A^1}\right)(L_n + \ldots + L_{14})$$

The total cost of retirement of plant in service in any year N is $(100 - S)\, L_n$.

The normal depreciation reserve at the end of year N is, accordingly:

$$\text{Depr. Res.} = (100 - S)\, L_n - \left(\frac{100 - S}{A^1}\right)(L_n + \ldots + L_{14})$$

$$= (100 - S)\, L_n \left(1 - \frac{\frac{1}{L_n}(L_n + \ldots + L_{14})}{A^1}\right)$$

To get the normal depreciation reserve per dollar of surviving plant of any age

No. of Yr. *N*	Plant Surviving *L*	$(L_n + .. + L_{14})$	$\frac{1}{L_n}(L_n + \ldots L_{14})$	Depr. Res. per dollar. $1 - \frac{\frac{1}{L_n}(L_n + \ldots L_{14})}{A^1}$
0	100	726.90	7.26	0.000
1	99.07	626.90	6.33	0.129
2	96.95	527.83	5.44	0.251
3	92.76	430.88	4.65	0.361
4	85.67	338.13	3.95	0.457
5	75.08	252.46	3.36	0.538
6	61.50	177.38	2.88	0.603
7	46.31	115.87	2.50	0.656
8	31.72	69.56	2.19	0.698
9	19.51	37.84	1.94	0.733
10	10.65	18.33	1.72	0.763
11	5.06	7.68	1.52	0.791
12	2.02	2.62	1.29	0.822
13	0.59	0.59	1.00	0.862
14	0.00	....	...	....

Table No. 5. Computations of Depreciation Reserve Per Dollar of Surviving Plant.

N, we divide the foregoing equation by L_n, which gives:

$$\text{Depr. Res. per dollar} = (100-S)\left[\frac{1-\frac{1}{L_n}(L_n+\ldots.+L_{14})}{A^1}\right]$$

or, neglecting salvage, we would have:

$$\text{Depr. Res. per dollar} = 1-\frac{\frac{1}{L_n}(L_n+..L_{14})}{A^1}$$

The computation of the foregoing expression for all ages can be arranged in columnar form as given in Table No. 5.

The last column gives the normal depreciation reserve per dollar of surviving plant of the ages shown in column N, neglecting salvage, and subject to the assumptions made.

In order to obtain the normal depreciation reserve as of a certain date, we must know the amount of plant of each age in existence at that date. This information is obtained by applying the percentages shown in column L to the gross additions in each of the last 13 years. This computation for plant surviving December 31, 1920, has been carried out in Table No. 6, and the normal depreciation reserve for substation apparatus was found to be $2,807,000, or 40.5 per cent of the plant in service.

These figures may now be corrected to conform to the assumptions:

1. That gross additions are placed at a uniform rate throughout each year instead of at the first of the year.
2. That retirements are made uniformly throughout each year instead of at the end of the year.

We have for average life:

$$A=\frac{1}{100}(L_0+\ldots.+L_{14})-1,$$

or $A=A^1-1$.

Depreciation rate in per cent $=(100-S)/A$.

Expense of depreciation credited to reserve in year N is:

$$\text{Exp. of Depr. (yr. } N) = \frac{(100-S)}{A}\left(\frac{L_n+L_n-1}{2}\right)$$

Accumulated credits to depreciation reserve from the end of year N to the retirement of the last surviving plant will be:

$$\frac{(100-S)}{A}\left(\frac{L_n+L_{n+1}}{2}+\ldots.+\frac{L_{13}+L_{14}}{2}\right)$$

$$=\frac{(100-S)}{A}\left[(L_n+\ldots.+L_{14})-\left(\frac{L_n-L_{n+1}}{2}+\ldots.+\frac{L_{13}-L_{14}}{2}\right)\right]$$

But $(L_n-L_{n+1})+\ldots.+(L_{13}-L_{14})=L_n$

Therefore accumulated reserve credits will be:

$$\frac{100-S}{A}\left[(L_n+\ldots.+L_{14})-\frac{L_n}{2}\right]$$

The allowance for salvage is made by multiplying the normal depreciation reserve ratio, without salvage, by $(100-S)$. Thus if the net salvage on substation apparatus were 75 per cent, the normal reserve for accrued depreciation, which should stand against this property on December 31, 1920, would be 0.25×38.99 per cent or 9.75 per cent of the book value, or about $675,000.

Year	Gross Additions	Plant Surviving Dec. 31, 1920	Attained Age Years	Normal Depreciation Reserve Per Dollar Surviving Plant	Normal Depreciation Reserve Amount
1920	$1,332,000	$1,320,000	1	.129	$ 171,000
1919	1,356,000	1,314,000	2	.251	330,000
1918	995,000	923,000	3	.361	333,000
1917	966,000	827,000	4	.457	378,000
1916	985,000	740,000	5	.538	398,000
1915	1,048,000	645,000	6	.603	389,000
1914	1,079,000	500,000	7	.656	328,000
1913	1,122,000	356,000	8	.698	249,000
1912	707,000	138,000	9	.733	101,000
1911	968,000	103,000	10	.763	79,000
1910	856,000	43,000	11	.791	34,000
1909	828,000	17,000	12	.822	14,000
1908	707,000	4,000	13	.862	3,000
Total		$6,930,000			$2,807,000
Total depreciation reserve					$2,807,000
Total plant in service					6,930,000
Ratio of depreciation reserve to plant					40.5 per cent

No allowance for salvage.

Table No. 6. Normal Depreciation Reserve for Substation Apparatus.

The accumulated future cost of retirement of plant in service at the end of year N will be, as before, $(100-S)\,L_n$.

So that the normal depreciation reserve for plant at the end of the Nth year is

$$\text{Depr. Res.} = (100-S)\,L_n-\left(\frac{100-S}{A}\right)\left[(L_n+\ldots.L_{14})-\frac{L_n}{2}\right]$$

And the normal depreciation reserve per dollar of surviving plant is:

$$\text{Depr. Res. per dollar} = (100-S)\left[\frac{1-\frac{1}{L_n}(L_n+\ldots.L_{14})-\frac{1}{2}}{A}\right]$$

$$\text{Or Res. per dollar} = (100-S)\left[\frac{A+1}{A}\left(1-\frac{L_n(L_n+\ldots.+L_{14})}{A^1}\right)-\frac{1}{2A}\right]$$

Neglecting salvage,

$$\text{Depr. Res. per dollar} = \frac{A+1}{A}\left(1-\frac{\frac{1}{L_n}(L_n+\ldots.L_{14})}{A^1}\right)-\frac{1}{2A}$$

In order to correct the normal depreciation reserve ratio of 40.5 per cent previously obtained to take account of uniform distribution of gross additions and retirements over each year, we proceed, letting $D.R.$ stand for the uncorrected depreciation reserve, and P stand for the plant in service, as follows:

Normal depr. res. (corrected) $=(DR)\ (A+1)/A-P/2A$, which for substation apparatus having average life $A=6.3$ years gives:

$$\text{Normal depr. res.} = \frac{7.3}{6.3}\times 2{,}807{,}000-\frac{6{,}930{,}000}{2\times 6.3}$$

$$=\$2{,}702{,}000.$$

Or 38.99 per cent of the plant in service on December 31, 1920.

By the use of the same method, the normal depreciation reserve, which should be associated with each of the depreciable fixed capital accounts, can be computed, and the total normal depreciation reserve for the entire property obtained by addition of the component parts. For a modern telephone plant having a healthy rate of growth, the normal depreciation reserve will usually lie between 20 per cent and 30 per cent of the book value.

Frequent comparisons of existing reserves for accrued depreciation with the reserves which are required, on the basis of known annual depreciation rates, to maintain the integrity of the investment in plant, and meet the losses due to future retirements of worn out, obsolete or inadequate equipment, are of considerable importance. Should the existing reserves be found inadequate, sound business policy requires that the annual depreciation rates

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be raised to a point where a proper depreciation reserve will be built up within a reasonable number of years.

This is essential, since the application of depreciation rates based upon the true average life of the plant and correct estimates of salvage will never supply an existing deficiency in the reserves. Conversely, if the existing depreciation reserve is found, upon comparison with the normal reserve, to be unnecessarily and excessively large, a temporary reduction of the annual depreciation rates is permissible.

Personally Placing the Facts Before People Brings Results.

The Northwestern Bell Telephone Co., which faced similar conditions in North Dakota, where a dozen or more communities banded together for the purpose not only of resisting the continuance of existing rates but to hammer them down to former levels, is achieving excellent results in Nebraska by personally placing the facts before the people of the disgruntled communities.

Lloyd B. Wilson, general commercial superintendent, says that when the company came to thoroughly investigate the situation, matters were not as bad as they looked. In a number of instances it was discovered the city clerk had sent in a remonstrance without authority from the council, or the secretary of a chamber of commerce had taken upon himself the duty of registering a protest without having been so instructed. The agitation was also helped on by the usual group of politicians intent on swinging onto anything that looked popular.

In several cases, resolutions of censure of the company and threats to bodily cut off service have been rescinded. In a number of cases it was found that 50 per cent of the people who signed petitions to take out telephones, were not subscribers.

The company has carried its case directly to the people through its representatives. Mr. Wilson says it is preparing to show these communities the reasonableness of the rates, and when these are shown he believes they will be accepted. The trouble is that the politicians seize upon telephone rates as an issue quite popular with the farmers now because few of them have been reduced from war-time levels, an impossibility because none of them were raised over 25 per cent.

Mr. Wilson says that the company's experience in North Dakota had given additional proof of the inherent fairness of the people when they know the facts about a public utility. The state railway commission there had refused to put into effect rates asked for by the company. It was necessary to go into federal court, and then rates that represented a really important addition to the yearly expense bill of merchants and farmers were put into effect.

The entire organization was used to get the facts to the people. First the company took particular pains to inform the members of the organization, including the operators of the actual facts of the company's situation. In many cases the best work in putting this information across in the various communities was done by the chief operators. The editors of the state were made thoroughly familiar with the details of the company's claims and the necessity for higher rates.

In spite of the fact that North Dakota is generally supposed to be the hotbed of all unrest in this section, not an unfavorable comment was made by the newspapers.

The only city where the company had any real trouble was in Hebron. There the mayor of the town had spoken bitterly and caustically of the company, and took it upon himself to circulate a petition, each signer to which agreed to discontinue service at a certain time. As soon as she heard it, the chief operator took off her office apron, touched up her locks, put on her hat, and proceeded to canvass all of the subscribers who had signed. When she got through, the only name left on the petition was that of the mayor—and his service was discontinued for non-payment.

Mr. Wilson says that the campaign ended with a better feeling toward the company than had before existed, and that while the company had lost a little business in the state it was no more than could reasonably have been expected in the business depression there existing.

Commissions, Courts and Councils

Discussion and Rulings of State Bodies Having Supervision Over Telephone Companies—Decisions of Courts in Matters of Interest to Public Utilities and Actions of City Councils Relative to Franchise, Rates and Service

Purchase of Valley Home By Michigan Bell Approved By I. C. C.

Acquisition by the Michigan State Telephone Co. of the property of the Valley Home Telephone Co., which operates exchanges and toll lines in Bay, Saginaw, Genesee, Huron and other counties in Michigan, was approved March 18 by the Interstate Commerce Commission. A certificate was issued declaring that the step is of "advantage to the persons to whom service is to be rendered and in the public interest." The Michigan State corporation will pay $1,250,000 for the plant of the Valley company.

Official Goes to Los Angeles to Carry Out Commission's Order.

In compliance with the order of the California Railroad Commission, George E. MacFarland, president of the Pacific Telephone & Telegraph Co., is now in Los Angeles to take charge of the intensive development effort of the Southern California Telephone Co.

While realizing that the program laid out by the commission to be complete, under penalty, by the end of July, is very difficult, Mr. MacFarland is hopeful, and is determined to do his part to bring about the improvement. He expects to be in Los Angeles for several months, and has brought a part of his staff with him. From Los Angeles, he will also direct the operations of the parent company at San Francisco, which he can readily do by long distance and letter.

The order of the commission that the head of the parent company personally direct the local extension work, expressed confidence in the efforts already being made by officials and personnel of the Southern California company. Mr. MacFarland's presence at Los Angeles was ordered so that "definite and final authority" might be at hand.

It is said that the company now has more than 5,000 employes bending their efforts to the enlargement of the service, and that this number, particularly in the matter of linemen, and laborers, will be increased before Mr. MacFarland ends his supervision of the work. The development is being undertaken with a view to the future, which will mean greater expenditure of money and effort than would be needed merely to meet the immediate situation.

Merging of Telephone Systems Is Urged as Plan to Save.

Unnecessary duplication in telephone service along the coast was the argument presented by officials of the Pacific Telephone & Telegraph Co. and the Northwestern Long Distance Telephone Co. for consolidation of the two systems at a hearing in Olympia, Wash., recently. F. Williams, chairman of the Oregon Public Service Commission, and Hance Cleland, supervisor of public utilities in Washington, heard the case and will submit recommendations with the record of the proceedings to the Interstate Commerce Commission for final action.

F. H. Crosby, president of the Northwestern company, declared a saving of from $75,000 to $80,000 a year might be effected by the consolidation with the Pacific company. The Northwestern company operates branch lines in Oregon and along the Columbia river in Washington, the main line running from Portland to Tacoma, Seattle, Bellingham and Port Angeles.

United States Court Enjoins City from Enforcing Reduced Rates.

A temporary injunction preventing the city of Stuttgart, Ark., from enforcing a lower schedule of telephone rates passed by the city council on February 6, was granted the Rice Belt Telephone Co., of Jonesboro, by Judge Jacob Trieber in the United States District Court on February 27. The company was placed under $5,000 bond.

Under this injunction the telephone company is permitted to operate under the rates now in force until the hearing of an application for a permanent injunction. No date was set for the hearing on a permanent injunction.

Judge Trieber, however, issued an order compelling the telephone company to deposit monthly in the registry of the court, the difference between the rates now in force and the new lower rates, until such time as the case is finally disposed of. If the case is finally decided in favor of the company this fund will be turned over to it, but should the case be decided in favor of the city it will then be refunded to the telephone subscribers.

Bond Issue to Refund Old Bonds and Build New Exchange.

The Home Telephone Co., of Covina was authorized by the California Railroad Commission on March 15, to issue and sell for cash at not less than 87½ per cent of their face value and accrued interest, $50,000 of first and refunding mortgage 6 per cent bonds. Of the proceeds the company is authorized to use $38,700 to refund 5 per cent bonds and to apply the remainder to the cost of a new exchange building.

Telephone Joint Rate Injunction Hearing Begun in Federal Court.

Hearing on the petition of the Southern Bell Telephone & Telegraph Co., seeking to enjoin the Georgia Railroad Commission from requiring it to establish joint rates in conjunction with the Montezuma Telephone Co., of Montezuma, began in the United States court on March 10 before Judge Samuel H. Sibley.

An order of the railroad commission issued last summer directed the Southern Bell company to co-operate with the Montezuma Telephone Co. in establishing joint rates. Execution of the order was stayed through a temporary restraining order obtained from Judge Sibley.

Idaho Company Wants Free Service Under Old Contract.

The complaint of the Idaho Metals Co. against the Mackay Telephone Co., of Mackay, Idaho, has been set for hearing at Mackay April 14 by the Idaho Public Utilities Commission.

The complaint sets out that the telephone company refused to furnish free service on two telephones for which no charge had been made prior to the telephone company coming under new management. The metals company maintains that its contract with the former operator of the telephone company is such that the new management cannot charge toll for service.

Valuation of Property a Factor in Muncie, Ind., Case.

A big difference of opinion exists between the Indiana Bell Telephone Co. and the city authorities at Muncie, Ind., as to the valuation of the telephone company's property there. As a result the residents of Muncie are wondering what estimate will be put on the property by the Indiana Public Service Commission in its decision on the pending petition of the company for an increase in rates.

The city's contention is that the value is not more than $711,000, while the company's contention is that it is $1,158,000. This marked disagreement results principally from the fact that the company claims a right to a return on a war-price valuation, or a valuation as of the present time, while the city contends that the valuation should take into account the actual investment in dollars as one factor and that the valuation should not be more than the tentative valuation of $654,000 by the commission two years ago plus $57,000 spent in net additions, or a total of $711,000.

The city contends that the evidence shows the actual amount invested is only $424,000. It does not ask that the commission find that amount to be the value of the pending case, but it submits that the company's claim of $1,158,000 in view of the actual investment is grossly exorbitant, particularly in view of the fact that the plant was constructed, with the exception of $60,000 spent for net additions since 1913, before the time of war prices.

In oral argument before the commission at a hearing at Muncie last week, Arthur D. McKinley, city attorney, placed emphasis on the evidence of actual dollars invested, and calling attention to the commission's tentative valuation of $654,000 two years ago, said he could not see how the commission could go back on its finding at that time.

This brought a reply from R. F. Davidson, attorney for the telephone company, who said there was only one trouble about the theory of original cost, and that trouble was that in dealing with a question of value "you have to deal with the United States Supreme Court," which, he said, had decided that a utility is entitled to a return on the value at the time the property is used, and not on the value a number of years ago.

As to the valuation by the commission two years ago, Mr. Davidson said the company did not accept it as reasonable, but filed a written protest against it.

Talks in German Over Telephone—Refused Service.

Because Rev. G. Erdman talked over the telephone in German, the Houston Telephone Co. of Houston, Randolph county, Ill., refused to allow him telephone connections.

That is the charge made against the telephone company in a petition filed with the Illinois Commerce Commission by Erdman on March 11 asking that the telephone company be ordered to give him service.

The Houston Telephone Co., the commission's records show, had previously been complained of on September 6 and December 4, last, and on January 18. Letters addressed to Secretary Orville Harris of the company, it was said, have been ignored.

Missouri Supplementary Order Grants Toll Charges.

The Missouri Public Service Commission found on March 10 that free toll service with foreign exchanges congested the lines of the Clinton County Telephone Co., of Plattsburg. It further found that the greater portion of these toll lines had been built and maintained at the expense of the Clinton County company.

Contracts for free toll service having expired, the commission decided that its previous order should be modified, and authorized the company to file a schedule of rates to cover toll service from its exchanges at Plattsburg, Trimble, Gower and Agency, to and with the foreign exchanges belonging to the Platte County Telephone Co. and the Dearborn & Edgerton Telephone Co., located at Platte City, Camden Point, Linkville, Dearborn and Edgerton.

Subscribers First Protest, Then Approve, Rate Increase.

Acting on the petition of subscribers that the rate increases asked by the Avilla Telephone System, of Avilla, Mo., be allowed, the Missouri Public Service Commission on March 14 approved for the second time the schedule filed by the company.

The increases had been previously granted, but on protest of subscribers the

commission suspended the effective date of the order from February 1, 1922, to June 1. On March 7, a number of patrons came to the aid of the company with a petition, signed by several of those who had formerly protested, stating that they believed the company's schedule of proposed rates to be fair and just. The supplementary order resulting from this action is effective April 1.

The new monthly rates follow:

	Business
Direct line	$1.25
Two-party line	1.25
Four-party line	1.25
	Residence
Direct line	$1.25
Two-party line	1.25
Four-party line	1.25
Rural, or Farm Line, Service.	
Class A switching	$0.75
Class B service	1.25

No Service, So Local Business Men Take Over Exchange.

R. E. Louden, who has operated the Tri-County Telephone Co., of Stapleton, Neb., for a number of years, has disposed of his interests to a group of local business men headed by W. H. Quade, banker. Mr. Quade wired the state railway commission to please send a full schedule of the rates authorized the company, as his predecessor evidently had not kept them in his files.

Members of the commission readily believe this latter statement. They have had all sorts of trouble with Mr. Louden. He operated in the sandhill country where ranches are far apart and returns very slender. In spite of his trying to do all of the work, he was unable to prevent a deficit, and two or three times closed down the exchange.

The courts and the commission have both ordered him to reopen and to establish certain toll collections, but the last time he stopped he wrote in that he had nailed the exchange door shut, and if the commissioners thought they could run the company, to hop to it.

The lack of telephone communication proved too burdensome, and now the people themselves have undertaken to furnish the service they were reluctant to pay Mr. Louden a reasonable rate to perform.

Asks Court to Compel Company to Install Accounting System.

Action has been begun in the local courts by the Nebraska State Railway Commission against the Frontier Telephone Co., of Hubbell, to require it to keep the accounting system installed by a commission representative.

The commission states that the company has failed, neglected and refused to do this, and the equity powers of the court are invoked for the purpose of compelling obedience to the commission's order, which, under the statutes, has all the force and effect of law.

The company operates a small system, with 181 subscriber stations, 127 miles of wire and switching and long distance connections. Under a general order issued February 11, 1919, all companies were required to keep a uniform system of books. About a year ago E. L. Lewis, from the commission, installed a set for the Frontier company, but its officers refuse to make proper entries or make monthly reports.

In its petition the commission says that it is impossible to examine and audit the company's accounts to ascertain its financial condition and thus make proper and equitable rates. The company is in Class E, with revenues of less than $5,000 a year.

O. E. Johnson, in charge of the installation of these systems, says that it has been difficult to get the managers of small companies to realize the importance to them of properly kept books, and they are the ones who most profit by them. Time and again it has been developed by experience that the loose system of books kept by the smaller companies has kept the owners in complete ignorance of how their assets were being wasted, and they were astonished to find, when some serious breakdown occurred in service-giving that they were practically broke, with no hope of getting the money to get back on their feet.

Mr. Johnson and his assistants have been able to convince the greater majority of the managers that the simple methods for the small companies mean no extra bookkeeping cost and very little extra time, and can mean keeping out of the hole. Only a few of the companies have not yet been reached, and more than half of those where an installation has been effected, are up on their toes and enthusiastic about the system.

Ohio Company Granted Rehearing on Rate Increase Case.

The United Telephone Co., of Bellefontaine, Ohio, has been given another chance in its effort to secure authority to increase its telephone rental rates in Bellefontaine and Logan county. The Ohio Public Utilities Commission has fixed the date for a rehearing for April 19.

Eastern Pennsylvania Company Increases Rates in Several Towns.

The Bethel & Mt. Aetna Telephone & Telegraph Co., of Myerstown, Pa., has announced a schedule of increased rates, effective April 1, application for which has been filed with the Public Service Commission.

The Bethel & Mt. Aetna company is one of the largest rural systems in Eastern Pennsylvania. In addition to 24 towns affected in Berks county, others in Lebanon county will have to pay the new rates.

Increases ranging from $3 to $6 a year are specified, and certain special flat rates are cut out. The time actually used will be charged for, and on bills not paid promptly, a 10 per cent penalty will be added.

Expect South Carolina Governor to Sign Rate Reduction Bill.

Only the signature of Governor Cooper of South Carolina is necessary to make a law, recently passed by the state legislature, reducing South Carolina telephone rates of the Southern Bell Telephone & Telegraph Co. to the 1920 level. It is unofficially reported that the governor will sign the measure.

It is also understood that a test case will be brought to determine the constitutionality of the bill, known as "the Foster bill," or that an appeal will be made to the new railroad commission to continue the increased rates.

The Foster bill is the result of strenuous action by the South Carolina Telephone Users Association, which—because it was dissatisfied with the commission for granting the increase—went over the head of the commission to the legislature for relief.

Increase Denied Because Company Failed to Keep Books.

The application of the South Dakota Farmers Mutual Telephone Co., of Doland, for a rate increase was denied on March 11 by the South Dakota Railroad Commission. At a hearing, March 5, the company was requested to furnish information relative to operating and maintenance costs, supplies on hand, money due, outstanding indebtedness, annual income, and a statement of the purposes for which the revenues had been used.

This information not having been furnished, and the annual report required by law not having been filed since 1919, the commission ordered the company to open and keep a set of books in accordance with the system devised by the board.

Destroyed Overhead Lines to Be Replaced by Underground.

The Wisconsin Railroad Commission, on March 13, issued a certificate of authority to the Necedah Telephone Co., of Necedah, authorizing it to issue 200 shares of its capital stock of the par value of $25 per share, making a total issue of $5,000.

This is done for the purpose of securing funds with which to pay for the replacing of all telephone lines in the village of Necedah by an underground cable system throughout the village. The recent sleet storm practically destroyed all the overhead lines of the company.

Higher Rates Contingent on Improved Service.

A decision was rendered March 9 by the Wisconsin Railroad Commission in the matter of the application of the Mount

Vernon Telephone Co., of Verona, ordering that company to improve its service by complying with the service standards of the commission within one year from the date of the order. The decision further ordered the company to place in effect a charge of 5 cents on all messages transmitted by it over the clear toll line between Verona and Middleton.

The commission says that when the company notifies it that the service requirements have been completed, it will issue a supplementary order authorizing the following net rates:

Business, per month	$2.50
Residence, per month	1 50
Rural—	
Code ringing, per quarter	4.50
Full selective ringing, per quarter.	6.00

The present rates of the company are as follows:

Business, per month	$1.75
Residence, per month	1.25
Rural party line, per quarter	3.75
Rural secret call, per quarter	4.50
Rural selective ringing, per quarter	5.25

Extension sets at one-half the main line rental.

Desk sets 15 cents additional per month for residence and rural subscribers.

The company operates a rural telephone system and operates exchanges at Mount Vernon, Verona, and New Glarus, serving approximately 875 subscribers.

Portion of Stock Issue to Pay for Sleet Storm Damage.

The Westfield Farmers Telephone Co., of Westfield, Wis., was given authority on March 13 by the Wisconsin Railroad Commission to issue 200 shares of its preferred stock at $50 par value.

The total issue of $10,000 is for the purpose of securing funds with which to pay indebtedness incurred for capital expenditures and for additions and extensions to its property and plant and for other purposes properly chargeable to capital account.

A portion of this issuance is to be used to pay for the replacement of lines destroyed by the sleet storm in the latter part of February.

Rate Hearing at Laramie, Wyo., Ends Suddenly.

The hearing on the application of the Mountain States Telephone & Telegraph Co., before the Wyoming Public Service Commission on March 9, for permission to raise certain telephone rates in Laramie, was ended suddenly, H. M. Huntington of the commission taking the matter under advisement.

The telephone company placed but one witness on the stand, R. M. Morris, the commercial engineer, who went into the matter at some length and presented some interesting and important testimony. He was cross-examined by F. E. Anderson, who represented certain interests opposed to the proposed increase in the rates.

At the conclusion of the cross-examination Milton Smith of Denver, the vice-president and general counsel of the company, announced that the company would rest on the evidence adduced both in the direct and cross-questioning of the witness.

Summary of State Commission Hearings and Rulings.

CALIFORNIA.

March 15: Home Telephone Co., of Covina, authorized to issue and sell at not less than 87½ per cent of face value and accrued interest $50,000 of first and refunding mortgage 6 per cent bonds. Part of proceeds to refund 5 per cent bonds and remainder to build new exchange.

IDAHO.

April 14: Hearing at Mackay on complaint of Idaho Metals Co. against Telephone Service Co., of Mackay. Complainant seeks to establish free service under old contract.

ILLINOIS.

March 11: Order issued re-suspending until September 11, 1922, the proposed increase of rates in Huntsville, Schuyler county, of the Shiloh Mutual Telephone Co. In the meantime, the commission will hold hearings and conduct an investigation into the reasonableness of the proposed increased rates.

March 23: Hearing at Springfield on application of Coles County Telephone & Telegraph Co., of Mattoon, for advanced rates in Mattoon, Charleston, Humboldt, Oakland and Ashmore.

April 13: Hearing on petition to reduce rates in Chicago postponed to this date at request of Illinois Bell Telephone Co., to enable company to compile data.

INDIANA.

March 16: Indiana Bell Telephone Co., authorized to issue $4,000,000 of 6 per cent demand notes to reimburse the company's treasury for capital expenditures and to retire notes. Of the total amount, $1,875,000 goes to retire Central Union Telephone Co. 7 per cent notes given in purchase of the Indianapolis Telephone Co.; $2,047,436 for net additions to the company's plant and equipment from 1921 to February, 1922; $40,000 to retire bonds of the United Telephone Co., of Bluffton, which was a merger into the Bell company; $30,386 to pay for the plant additions since January 1, 1922, and the remainder for certain state and federal fees.

MISSOURI.

March 10: Clinton County Telephone Co., of Plattsburg, permitted to file schedule of toll rates previously denied.

March 14: Order suspending rate increase set aside, upon petition of subscribers of Avilla Telephone System, of Avilla.

March 15: Supplemental order entered making permanent the temporary rates granted Missouri Union Telephone Co., of Calhoun, February 18, 1921.

NEBRASKA.

March 13: Application filed by the Farmers' Mutual Telephone Co., of Avoca, for permission to make certain changes in its rate schedules.

March 13: In the matter of the application of the Swanton Mutual Telephone Co. for permission to charge $9 per quarter for business service; permission granted to withdraw it and consolidate it with another application.

March 13: Application filed by the Swanton Mutual Telephone Co. for permission to promulgate a schedule of rates.

March 14: Complaint filed by citizens of Bruning against the Lincoln Telephone & Telegraph Co. asking for the removal of the manager at the local exchange and for a betterment of service conditions.

March 14: Complaint filed by the Omaha Chamber of Commerce against the Northwestern Bell Telephone Co., raising the question of whether the 10 per cent surcharge on all exchange rentals applies to service authorized since it was first allowed.

March 15: Application of the Campbell and Riverton telephone companies for permission to establish a toll rate of 10 cents between the towns, found to be reasonable and warranted, and allowed. The companies have recently built a new and up-to-date toll line and asked for a charge that would make the investment remunerative.

NEW YORK.

March 20: Hearing at New York City on complaint of Manuel Neufield against New York Telephone Co., for failure to install telephone.

March 21: Hearing at Buffalo on joint petition of Jamestown Telephone Corp. and Home Telephone Co., of Jamestown, in respect to extension of certain underlying mortgage bonds and mortgage.

March 23: Hearing at Albany on motion of commission as to rates, charges, and rentals and the regulations and practices affecting rates, charges and rentals of the New York Telephone Co.

NORTH DAKOTA.

March 14: Permission given the Northwestern Bell Telephone Co. to discontinue toll station at Eldridge.

March 14: Permission given the Northwestern Bell and Midwest Power Co. to transfer the Devils Lake-Starkweather toll line.

March 14: Application of Cappio Telephone Co. to discontinue operation of switchboard at Foxholm.

OHIO.

April 19: Rehearing on application of United Telephone Co., of Bellefontaine, to increase rates.

SOUTH DAKOTA.

March 10: Increase on residence rates and service connection charges allowed Davidson County Co-operative Telephone Co., of Mt. Vernon, at its Ethan exchange.

March 11: Rate increase denied South Dakota Farmers' Mutual Telephone Co. of Doland. Ordered to keep set of books.

WASHINGTON.

March 10: Hearing at Olympia on application of Pacific Telephone & Telegraph Co. and Northwestern Long Distance Telephone Co. for consolidation of the two companies.

WISCONSIN.

March 13: Westfield Farmers' Telephone Co., of Westfield, given authority to issue $10,000 stock to cover indebtedness on capital expenditures, etc.

March 13: Authority for stock issue of $5,000 granted Necedah Telephone Co., of Necedah, to put in underground system.

March 13: Stock issue of $10,000 previously authorized Mount Horeb Telephone Co., of Mount Horeb, cancelled and permission given to issue bonds amounting to $11,000.

March 13: Rate increase granted Prairie Farm, Ridgeland & Dallas Co-operative Telephone Co., of Prairie Farm.

WYOMING.

March 9: Hearing on application of Mountain States Telephone & Telegraph Co. for rate increase in Laramie; matter taken under advisement.

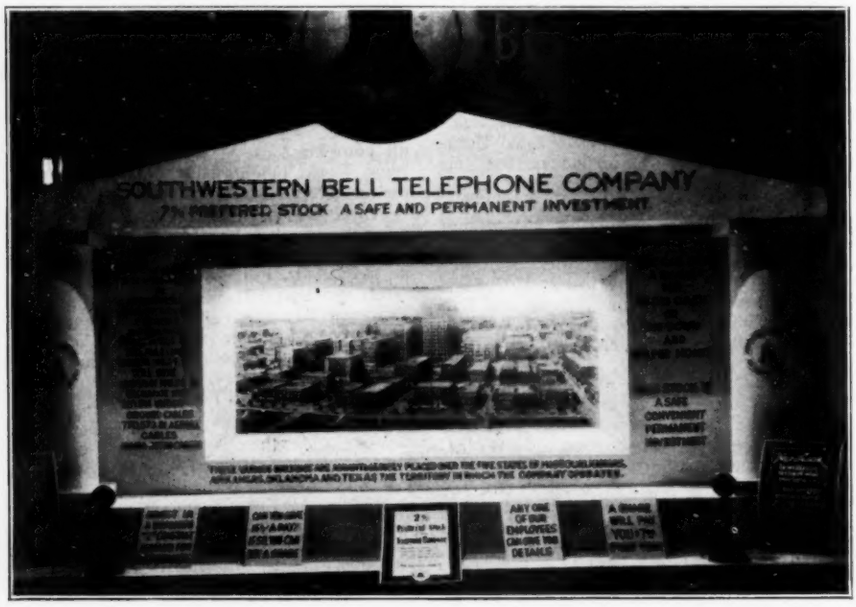
What Is Your Company Doing?

Chats About Company's Doings.

By Stanley R. Edwards.

In connection with the campaign to sell stock of the Southwestern Bell Telephone Co., every means was utilized to obtain publicity. In Oklahoma City, a window display was arranged to set forth the features of the 7 per cent preferred stock sale in Oklahoma.

The window faced on the main thoroughfare of the city and attracted exceptional attention. The display was made of beaver board, painted white with lettering in blue. The Telephone City picture is an artist's conception of the exchanges of the company's system grouped together. The illustration shows how the display was arranged.



Windows of Exchange Buildings Afford Excellent Publicity Display Opportunities—The Southwestern Bell in Oklahoma City Had This Display.

"When Will Telephone Rates Be Lowered?" is the subject of "A Talk to the Employes" of the Tri-State Telephone & Telegraph Co. by President G. W. Robinson, put up in vest-pocket booklet form, which was recently given to each employe of the company.

The answer to the question is: "We do not know, but we do know that they cannot be lowered right away."

President Robinson then gives the employes some explanation of the causes behind this answer so that they, in turn, can furnish users of the telephone with a clear understanding of the situation. The rise in prices of general articles from 1914 to May, 1920, and the decline to August 1, 1921, to about 76 per cent above 1913 prices was pointed out.

"On August 1," says President Robinson, "they started upward again, and economists tell us they may now be expected to go back gradually and become steady at about 100 per cent over 1913. This upward movement will be slow or fast according as business conditions improve.

"Telephone materials show an altogether different story. Copper and lead, for instance, went way up in 1917, then dropped because of government price-fixing, and then, at the close of the war, such large surplus stocks were in existence that copper dropped to the lowest price in years, and is still down below the cost of its production. Copper will go up again as the demand for it grows.

"Copper and lead form but a small part of the materials which telephone companies use in every-day operations. Other materials, such as telephones, switchboards, hardware, batteries, etc., are used in such quantities that the average of all materials used in the telephone business shows the following history:

"The average of the telephone material prices started up in 1916, but they did not go up as fast, or as far as general prices. On January 1, 1918, they were only 61 per cent higher than 1913, while general prices had gone up 105 per cent. They went down a little in 1919, and then started up again, until, on August 1, 1921, they were 90 per cent over 1913 prices, while general prices were only 76 per cent higher than 1913.

"Telephone materials then did not go to unreasonable heights, and hence will not now drop very much. As time goes on, they will undoubtedly adjust themselves to general prices as the general prices move upward to meet them. No relief then is in sight as to material prices.

"Material prices do not affect the cost of operation of a telephone plant, because very little materials comparatively are used in operation. They only affect the amount invested in building new construction or rebuilding old, which is not paid for from operations, but is paid by the investment of new money in the business, or the reinvestment of old from the depreciation reserve. The cost of operation is largely labor. It is, therefore, necessary to consider labor costs, since on them very largely depend current telephone rates."

The state of Minnesota has a law known as the minimum wage law, under which a state commission fixes the minimum wage that must be paid female help. During the war, this commission rapidly increased the minimum wage which resulted in a decided increase in wages to operators, thereby affecting telephone rates. There has been no order decreasing these rates, so the telephone company must continue to pay wages it now pays to female employes.

No increases for men had been made until 1918, when lines were under government control. The government refused to grant increases until rates were obtained which would produce the necessary money. Applications were made to the railroad and warehouse commission, but these were denied.

In June, 1919, the state supreme court, following the United States Supreme Court, held that the government could fix rates, and new rates became effective July 1, 1919. Increased wages followed, but too late for telephone men to receive the increases that others had received.

"When carpenters, painters, bricklayers, plumbers, etc.," continued Mr. Robinson, "were getting $1 to $1.25 an hour, telephone men of equal ability as craftsmen received only 75 to 81 cents an hour. Today, telephone wages compare favorably with, and are not higher than wages in other lines of business.

"Telephone wages to men were lower all through the war than those received in other lines, and, from present scales, it is apparent no cut in wages should be made under present conditions.

"In one thing telephone companies are gaining and thus reducing expenses. As the variable conditions of the past years become settled, the labor turnover lessens, and efficiency greatly increases. This has lowered telephone costs, but, due to the railroad and warehouse commission refusing adequate rates, the telephone company has been operating at a loss—has been able to pay no dividends on its common stock.

"The rates granted by the federal court resulted in the company making a little better showing, but not enough to earn these common stock dividends. It is hoped that the increase in efficiency and decrease in labor turnover will soon result in lowering expenses enough so that a margin of profit will be left to equal a small dividend to the common stockholders.

"The common stockholders have invested in this company 4½ million dollars in cash. They are entitled to interest or wages on that money as much as you or I are in our labor. Telephone rates cannot go down until net earnings have increased beyond their dividend requirements.

"Even with this explanation many will point to what they claim have been high rate increases. In answer to this we should state that, for years in the past, Minnesota was favored in having lower telephone rates than other states, due to: first, very low operating costs; and, secondly, to a small telephone development. During the last ten years telephones in service have increased in Minnesota by leaps and bounds, which carries with it an increase in operating costs greater than the percentage increase in telephones—a peculiarity of the telephone business.

"Costs of operation do not decrease with volume in the telephone business as in other lines, but on the other hand, they increase. This increase does not occur in general or supervising costs, but in interest on increased capital investment, maintenance of lines and traffic costs. If this were not the case, St. Paul and Minneapolis would have the lowest rate in the state, and the small village the highest.

"So, with the increased number of telephones, increased rates became necessary aside from the effects of the war, and would have occurred even had there been no war.

"Today, the business telephone rates in the cities of Minnesota are no higher than in comparable cities in other states, while residence rates are today lower in St. Paul than in most cities of like size in the United States, and the other exchanges run slightly lower than comparable cities.

"The Tri-State company is economically managed. A comparison of the operating costs of the company with the average operating cost of all companies in the United States of its class shows that the Tri-State cost is low. There can be no claim that rates are high because of extravagance or mismanagement.

"When will rates go down? We do not know. Not for some time to come, and the reason is that, because neither wages nor rates in the telephone business went up like other things, they have not a high level from which to recede. Telephone wages and rates seem to be about on a level today with all other things that we buy or use. To lower them means that telephone men must work for less than others, and the money invested in the telephone business will not earn what is invested in other lines of business.

"This will only result in men leaving the telephone field for other work, and in capital seeking other places for investment. The shortage of help and money would seriously interfere with telephone service. It is to the public interest that fair wages be paid for both men's services and the use of their money.

"The people of Minnesota are fair-minded people, but they do not understand. They see other things falling in price and naturally expect telephone rates to fall. It is up to you and to me as telephone people to explain these things to them that they may have the facts. Knowing the facts, they will agree with us.

"Our patrons should be assured that we are not in the telephone business to maintain high rates. We are in business to furnish good telephone service at prices which will earn reasonable and fair wages for both the employes, and the money invested in this property which make our service possible. The company will welcome lower rates when conditions change so that this is possible. Today it is impossible."

Employes of the Tri-State company are now in possession of facts regarding rates so that they can talk most intelligently to the public—and they do.

In order to create a better understanding in regard to telephone rates and conveniences in the city of Richmond, Ind., W. M. Bailey, manager of the Richmond Home Telephone Co., is sending operators to visit telephone users in the city and to explain anything which proves of interest to them.

Two operators employed by the company are kept out all day calling on the residents of Richmond who have telphones. In this way, Mr. Bailey is confident that the patrons will become more familiar with the rates and system under which the company is operating.

Holding an Arkansas train long enough to let a passenger do some long distance telephoning sounds like an extreme measure. But this is exactly what a Joplin, Mo., telephone girl accomplished when she learned that a man, who was badly wanted on the wire, was aboard the train bound for a distant part of the country.

The call was important; the operator was persistent; the station agent, at first positive in his refusals, finally backed down and said: "Well, maybe the train can be held just this once."

Trains are not being held all over the country at the instance of telephone girls, of course, but the incident is characteristic of the zest with which long distance operators of the Bell system are now playing the fascinating game of "per cent completed."

"Per cent completed" simply means that the long distance folks are doing valiant work toward bettering the service rendered the public by trying hard to complete every last call that is placed. A call is said to be completed when the connection is made and those concerned talk. If for any reason the call cannot be put through, it is "lost"—and somebody's "per cent completed" suffers.

And speaking of completed long distance calls, a call was recently placed with the Yale Telephone Co., Yale, Okla., for a party in Pittsburgh, Pa., and the circuit was completed and parties talking seven minutes later.

"The fast work on this call, put through at about 8:30 in the evening," writes Secretary-Treasurer L. W. Sherer of the company, "was possible through the hearty co-operation of the operators at the different switching points."

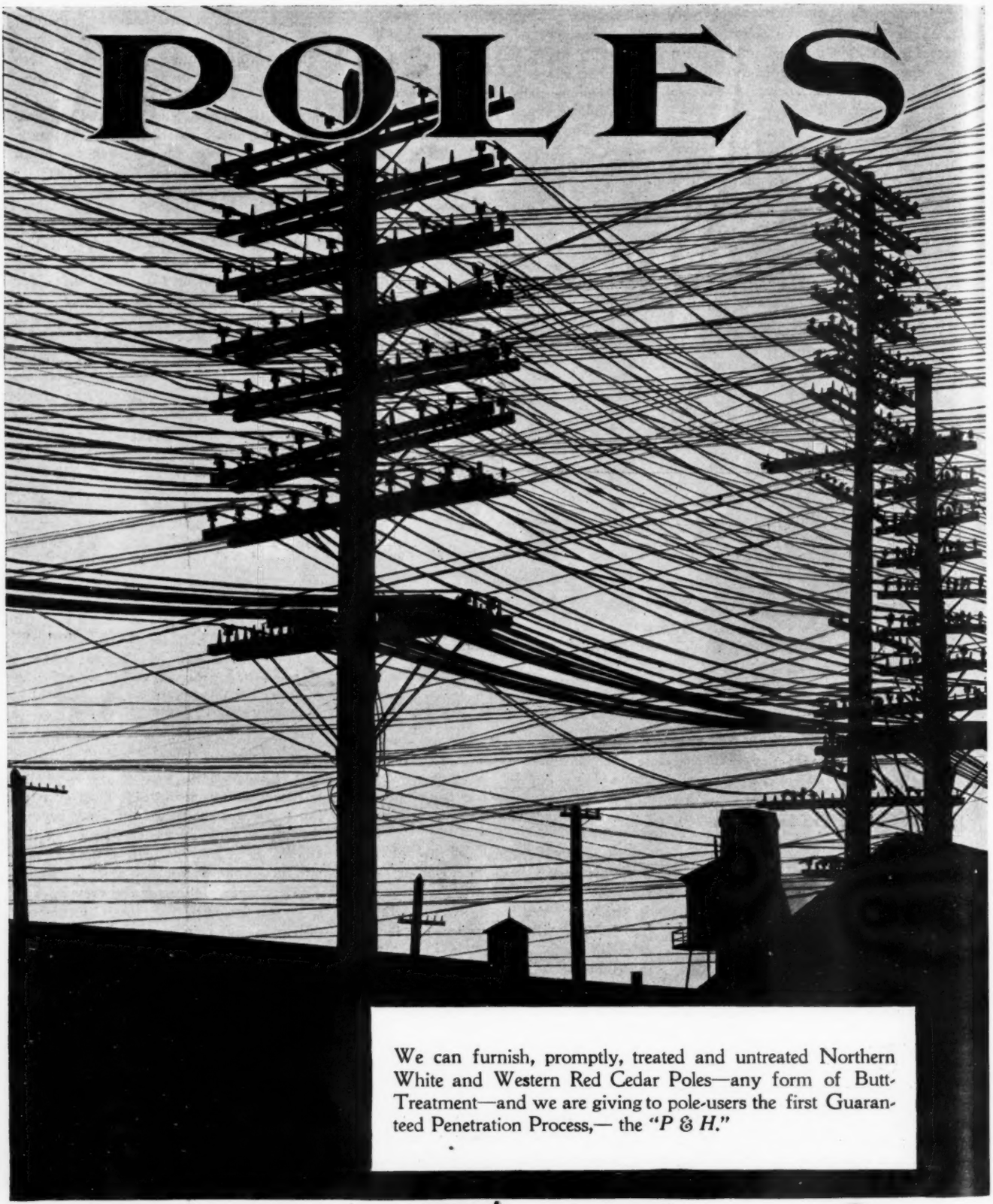
Almost one thousand new orders for extension telephones in 30 days rewarded the rather hectic campaign methods of Tri-State Telephone & Telegraph Co. employes, the period ending at noon, Saturday, March 11.

First of all, to start the campaign off right, the telephone company asked the Minnesota Railroad & Warehouse Commission for permission to suspend for 30 days the installation or service connection charge of $1 on each order for an extension telephone taken within the allotted time. This was granted and the battle was on.

The results were not only most gratifying to company officials but away beyond their most sanguine expectations. In the city of St. Paul, 724 orders were signed and in southern Minnesota, 186, making a grand total of 910 for the system.

To put it over so successfully, the co-operation and help of all employes, especially those of the commercial department, was needed and given. Some small amount of daily newspaper advertising was used to good advantage and an insert was sent out with the March bills. To follow up this sort of publicity, the card indexes were brought out and subscribers were called individually and told of the plan. As a result, orders, towards the close of the campaign, were recorded at the rate of 30 or 40 every working day.

This personal solicitation proved most effective. Subscribers, with hardly an exception, showed no resentment at being called but on the contrary were cordial interested and courteous. "A rather good demonstration," commented Rollo R. Stevens, general commercial superintendent, "that public relations in St. Paul between telephone subscribers and the telephone company are first class, better in fact than they have been for several years."



We can furnish, promptly, treated and untreated Northern White and Western Red Cedar Poles—any form of Butt-Treatment—and we are giving to pole-users the first Guaranteed Penetration Process,— the *"P & H."*

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MINNEAPOLIS, MINN.

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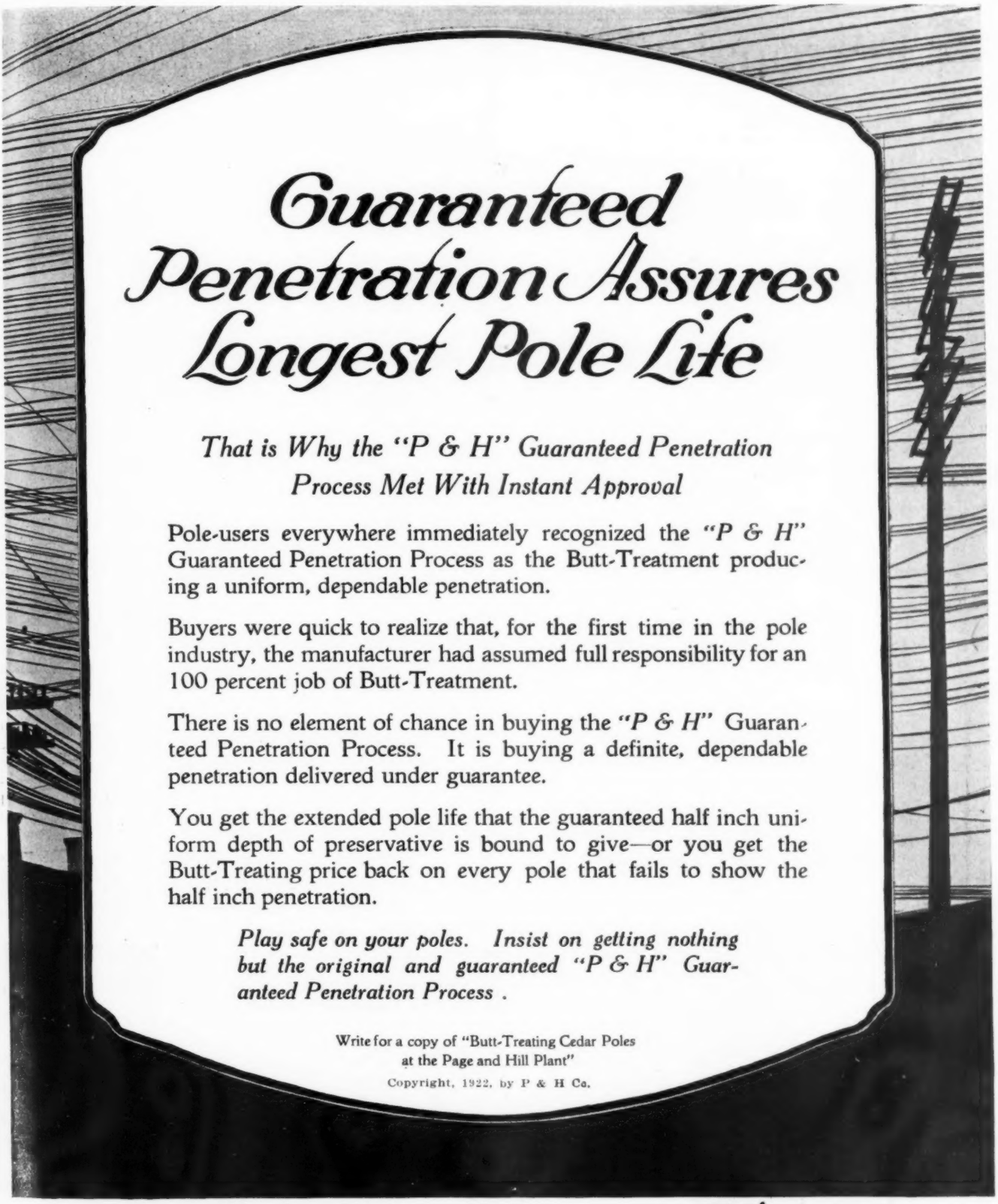

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That is Why the "P & H" Guaranteed Penetration Process Met With Instant Approval

Pole-users everywhere immediately recognized the *"P & H"* Guaranteed Penetration Process as the Butt-Treatment producing a uniform, dependable penetration.

Buyers were quick to realize that, for the first time in the pole industry, the manufacturer had assumed full responsibility for an 100 percent job of Butt-Treatment.

There is no element of chance in buying the *"P & H"* Guaranteed Penetration Process. It is buying a definite, dependable penetration delivered under guarantee.

You get the extended pole life that the guaranteed half inch uniform depth of preservative is bound to give—or you get the Butt-Treating price back on every pole that fails to show the half inch penetration.

Play safe on your poles. Insist on getting nothing but the original and guaranteed "P & H" Guaranteed Penetration Process .

Write for a copy of "Butt-Treating Cedar Poles at the Page and Hill Plant"

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311 Sumpter Bldg., Dallas, Tex.

19 S. La Salle, Chicago, Ill.
1416 Starks Bldg., Louisville, Ky.

Personal and Biographical Notes

A. H. Skinner has been appointed general manager of the Citizens Telephone Co., of New Castle, Pa. Mr. Skinner was formerly plant engineer of the New Brunswick Telephone Co., St. Johns, New Brunswick, Canada, and returned to the United States about a year ago.

G. W. McRae, whose appointment as chief engineer of the Illinois Bell Telephone Co. was announced recently, was born in Malden, Mass., where he received his preliminary education in the public schools and high school. After graduating from high school, he entered the Massachusetts Institute of Technology, from which he was graduated in 1910 with the degree of Bachelor of Science in Electrical Engineering.

Immediately after graduating Mr. McRae became connected with the American Telephone & Telegraph Co. at New York, in the toll traffic engineering branch. He rapidly became familiar with the details of toll traffic engineering work, being successively engaged in almost every branch of the work for about five years after entering the company's employ, when special work took him to Chicago.

In June, 1920, Mr. McRae became toll traffic engineer of the American Telephone

G. W. McRae, New Chief Engineer of Illinois Bell Company, "Came Up" Through the Traffic Engineering Branch.

& Telegraph Co., reporting to K. W. Waterson, assistant chief engineer.

W. R. Abbott, newly-elected president of the Illinois Bell Telephone Co., has been prominent in the business life of Chicago for many years. He was born in New York and educated in the public schools. His first position after leaving school

President Abbott of the Illinois Bell Company Began as Cashier in 1889 With Westchester (N. Y.) Company.

was in the auditor's office of the Erie Railroad, which position he filled from 1885 to 1889. He resigned to become cashier of the Westchester (N. Y.) Telephone Co. in February, 1889, and in 1890 went with the Metropolitan Telephone & Telegraph Co. as order clerk. Both the Westchester and Metropolitan companies have since been absorbed by the New York Telephone Co.

Mr. Abbott went to Chicago in 1893, the year of the World's Columbian Exposition, and became identified with the then Chicago Telephone Co. This connection was satisfactory to both parties and he has been with the company ever since. He has filled creditably many important and responsible positions in the Bell system, including those of order clerk, chief clerk to the general superintendent, special agent in charge of rights of way and claims, superintendent of suburban division, general commercial superintendent, and general manager.

As general manager he was in direct charge of the operation of the business for the past six years. He was made a vice-president and a director in 1920.

Mr. Abbott has been prominent in many social and business organizations, being former chairman of the executive committee of the Chicago Association of Commerce; former president of the Industrial Club; and is a member of the Illinois Chamber of Commerce, Chamber of Commerce of the United States of America, and American Institute of Electrical Engineers. He is a member of these clubs: Chicago, Chicago Athletic, Chicago Yacht, Exmoor Country, Aero Club of Illinois, Delavan Country Club, and Chicago Art Institute.

Jay G. Mitchell, of Springfield, Ill., secretary-treasurer of the Illinois Telephone Association, who has been seriously ill since the latter part of January, is now back at his office and resuming active work.

Frederick H. Reid, of Denver, formerly general manager of the Mountain States Telephone & Telegraph Co., is now vice-president of the Southern Bell Telephone & Telegraph Co. and Cumberland Telephone & Telegraph Co. with headquarters at Atlanta, Ga.

Mr. Reid entered the employ of the Bell company at Denver, Colo., in 1892. By close attention to, and faithful performance of, the duties assigned him, he was advanced until he reached the position of general manager which he now has left for a higher one with the Bell companies operating in Georgia, Florida, North Carolina, South Carolina, Alabama, Mississippi, Louisiana, Tennessee and Kentucky.

Obituary.

Louis Wirth, cable foreman, Tri-State Telephone & Telegraph Co., St. Paul, Minn., died at St. Luke's hospital March 7, the result of an acute attack of asthma and heart complications. Had Mr. Wirth been permitted to continue his telephone duties until June, 1922, he would have completed 30 years of service in the industry. He was 54 years of age and leaves, besides a widow, a family of 12 children.

Mr. Wirth entered the telephone business in St. Paul, June 15, 1892. Prior to his arrival in the United States from Switzerland, he was employed in an electrical manufacturing establishment at Schaffhausen. In this shop all sorts of electrical instruments of the time were manufactured and when telephones came into general use, telephone equipment was added.

The Late Louis Wirth Was a Telephone Man for 30 Years.

In 1890 he went to St. Paul, being first employed by the Paul Martin Electric Co. and later by the Edison company. Two years later he joined the local telephone organization as a lineman. In 1894 he was transferred to the cable department and was later promoted to foreman, a position he held most creditably up until the time of his death.

Financial Statements and Reports

Annual Reports of California Companies, New England Telephone Co., Michigan State Co., Pacific Telephone & Telegraph System, and Prairie Farm (Wis.) Ridgeland & Dallas Co.—Southwestern Bell Preferred Stock Issue Authorized

Operations of California Telephone Companies for 1921.

Reports of operations of the Dos Palos Telephone Co., Home Telephone Co., Honey Lake Valley Mutual Telephone Association, Kerman Telephone Co., Pomona Valley Telephone & Telegraph Union, Manteca Telephone & Telegraph Co., Redondo Home Telephone Co., the Ontario & Upland Telephone Co., and Turlock Home Telephone & Telegraph Co. for the year 1921 were recently filed with the California Railroad Commission.

The Dos Palos Telephone Co., operating in Dos Palos, reports operating revenues of $5,543.35, and operating expenses of $3,130.51, leaving a net operating revenue of $2,412.84. Interest, rent and other deductions totaled $224.38. The net corporate income for the year was $2,188.46.

The surplus at the beginning of the year was $507.07. Miscellaneous additions to surplus for 1921 amounted to $30.95 and miscellaneous deductions were $1,238.47. Dividends declared during the year totaled $330.18, leaving an accumulated surplus of $1,157.83 as of December 31, 1921.

The Home Telephone Co., operating in Covina, Azusa, Glendora, and adjacent territory, reports operating revenue of $63,818.53, and operating expenses of $44,263.01, leaving a net operating revenue of $19,555.52. There is a deduction of $10,462.20 for interest, rent, taxes, etc., and an addition of $25.48 for miscellaneous non-operating revenue, making the net corporate income for the year $9,118.80.

The surplus at the beginning of the year was $10,334.93, to which there were miscellaneous additions of $21.74 and miscellaneous deductions of $2,070.37. Dividends amounting to $7,396 left an accumulated surplus at the end of the year of $10,009.10.

The report of the Honey Lake Valley Mutual Telephone Association, of Honey Lake Valley, showed operating revenues of $5,536.63, operating expenses of $5,300.73, and a net operating revenue of $235.90. Deductions for interest, rent and other miscellaneous items totaled $1,027.26. The net corporate loss for the year was $791.36.

At the beginning of the year a deficit of $5,054.53 was shown. Miscellaneous additions to surplus during 1921 were $1,881.89 and deductions $103.39, leaving an accumulated deficit at the end of 1921 of $4,067.39.

The Kerman Telephone Co., of Kerman, reports operating revenue for last year of $4,963.55, operating expenses of $7,894.61, and a net operating loss of $2,931.06. Miscellaneous non-operating revenues amounted to $10.96, while interest, rent and other deductions were $981.83. The net corporate loss for the year is given as $3,901.93. At the beginning of 1921 a deficit of $6,824.69 was shown on the company's books and at the close of 1921 the accumulated deficit amounted to $10,726.62.

Operating revenues of $118,374.92 and expenses of $94,722.56, with a net operating revenue of $23,652.36 are shown in the report of the Pomona Valley Telephone & Telegraph Union, operating in Pomona, Claremont, Chino, LaVerne, and San Dimas. Non-operating revenues amounting to $224.75 are given and deductions for interest, rent and miscellaneous items as $15,897.11. The net corporate income for the year was $8,000, and dividends of this amount were declared for last year.

The Manteca Telephone & Telegraph Co., of Manteca, had an accumulated surplus on December 31, 1921, of $779.35, according to its report to the railroad commission. This company's operating revenues were $15,115.40, its expenses $13,297.71, and its net operating revenues $1,817.69. Interest, rent and other deductions totaled $1,038.34.

The report of the Redondo Home Telephone Co., operating in Redondo Beach, Hermosa Beach and Manhattan Beach, showed a net corporate income for the year of $902.84. Inasmuch as the company had a deficit at the beginning of 1921 of $9,448.52, the accumulated deficit at the close of last year was $8,545.68. Operating revenues were $35,408.61 and expenses $30,342.54, according to the report, and net operating revenues $5,066.07. Miscellaneous deductions amounted to $4,163.23.

The Ontario & Upland Telephone Co., operating in Ontario and Upland, reported operating revenues of $73,379.83 and expenses of $75,677.42, leaving a net operating loss of $2,397.59. Miscellaneous deductions totaled $13,551.41.

The net corporate loss for the year was $15,849. A deficit at the beginning of last year amounting to $90,519.41 was shown, so that the accumulated deficit as of December 31, 1921, was $106,368.41.

Operating revenue and expenses of $31,811.48 and $26,097.10, respectively, left a net operating revenue of $5,714.38, according to the report of the Turlock Home Telephone & Telegraph Co., operating in Turlock. Deductions for interest, rent and miscellaneous items totaled $4,895.40, leaving $818.98 as the net corporate income. At the beginning of the year there was a surplus of $901.16, from which there were miscellaneous deductions of $372.04. The accumulated surplus December 31, 1921, was $1,348.10.

New England Telephone Company Reports Good Year.

Earnings of the New England Telephone & Telegraph Co. were well maintained during the calendar year 1921, the balance available for dividends on the $66,472,700 of capital stock being equal to $9.02 a share, contrasted with $9.24 a share earned in 1920, and $8.16 a share in 1919. Operating expenses showed an increase of over $2,000,000, but this was more than offset by expansion of slightly more than $3,000,000 in gross revenue.

The report of President Matt B. Jones states that the year was marked by extreme activity in plant construction, and the construction program carried out was larger by several million dollars than any so far attempted by the company. The gross new construction for the year amounted to $15,111,900.

There were 154,080 new stations installed, which is considerably more than were installed in 1920, yet such was the demand for new service that it was impossible to meet the requirements of all who asked for it.

In order to meet the demand for service, the company has planned an increased program for 1922, which involves an expenditure of over $20,000,000. It is anticipated that three new automatic exchanges will be placed in service during 1922, while construction is proceeding on three exchanges which, it is expected, will be completed during 1923.

The sleet storm of November 28, 29 and 30 caused serious loss to the company. An unprecedented amount of telephone plant was destroyed and many thousands of subscribers' telephones were put out of service. Fortunately, however, the depreciation reserves of the company are ample to provide against loss of property, which will probably be in the vicinity of $1,500,000.

The reconstruction is proceeding rapidly, but it will be a number of months before complete reconstruction can be expected. As a result of almost complete destruction of two heavy toll lines between Boston and Worcester, it was decided to install immediately a second toll cable between these cities, which had been planned for 1923. The work is now under way and will be completed within a few months.

The early months of 1921 were, like the closing months of 1920, somewhat affected by loss of revenue due to business

stagnation. Since the middle of 1921 a slow but gratifying improvement has been noted and the company is satisfied with the operations for the year, all things considered.

The figures showing a comparison of operating revenues and expenses for 1919, 1920 and 1921 follow:

	1921.	1920.	1919.
Oper. rev...	$36,702,496	$33,606,341*	$12,928,014
Oper. exp...	27,320,287	25,151,030	9,397,457
Net op. rev.	$ 9,382,209	$ 8,455,311	$ 3,530,557
Taxes	2,487,408	1,980,366	886,495
Uncol. rev..	125,987	86,517	32,803
Total inc.	$ 6,768,812	$ 6,388,426	$ 2,611,258
Non-op. rev.	610,291	667,556	661,888
Gross inc.	$ 7,379,103	$ 7,055,982	$ 3,273,146
Deductions—			
Interest ...	1,012,449	588,535	563,077
Rentals, etc.	380,259	329,902	120,260
Net inc...	$ 5,986,395	$ 1,137,545	$ 2,589,809
Compensation from U. S. Gov., 7 mos.	.....	.....	2,835,121
Balance .	$ 5,986,395	$ 6,137,545	$ 5,424,934
Dividend ..	5,317,816	4,984,207	4,651,927
Surplus ..	$ 668,579	$ 1,153,337	$ 773,007
Misc. deduc.	146,054	13,458	†17,933
	$ 522,524	$ 1,109,878	$ 820,940
Earned per share	$9.02	$9.24	$8.16

*Government operated property for seven months in 1919.
†Additional to surplus.

Michigan State Company Earns $18 Share, Report Shows.

A net income of $3,227,436, permitting a dividend of $18 a share on common stock was earned by the Michigan State Telephone Co. in 1921, the annual report shows. On preferred stock an amount equal to a full year's dividend was earned. In 1920 there was a deficit after taxes and fixed charges had been deducted of $1,230,485, the fourth successive deficit.

Operating revenues amounted to $16,788,184 and expenses to $12,416,967, leaving a gross income of $4,371,216. The company has paid no dividends on its preferred stock since September, 1919, and there has been no dividend on common stock since 1914.

Eight million dollars will be expended in expansion work this year, President F. C. Kuhn said in his annual report to the stockholders. There were 11,725 new telephones installed during the last year and it is expected 15,000 will be placed in operation during 1922.

Report of Pacific Telephone & Telegraph System for 1921.

A consolidated statement of the operations of the Pacific Telephone & Telegraph Co., the Southern California Telephone Co., the Home Telephone & Telegraph Co., of Spokane, Wash., and the Bell Telephone Co., of Nevada, for the year ended December 31, 1921, recently presented by the directors to the stockholders, shows that 64,222 stations were added during the year, making a total in service of 1,088,425, composed of 842,005 company stations and 246,420 service, private line, and connecting stations.

The demands for service during the year continued to be heavy, the report states, notwithstanding lessened general business activities. Although 53,119 new telephones were connected during 1921, there still remained a large number of unfilled applications at the close of the year.

Gross operating revenues during 1921 totaled $40,576,456.82 and expenses $31,437,291.57, leaving a net operating revenue of $9,139,165.25. After deducting taxes, rents, interests, dividends, and other uncollectible items, there remained $1,200,634.16 for corporate surplus.

The consolidated balance sheet as of December 31, 1921, is as follows:

ASSETS.

Intangible capital	$ 12,150,941.86
Plant and equipment.....	131,087,333.25
Other permanent and long term investments	7,870,057.69
Cash and deposits	910,894.00
Bills and accounts receivable	3,048,919.08
Materials and supplies.....	2,641,972.42
Accrued income not due...	91,285.28
Sinking fund assets	304,505.07
Prepayments	389,777.85
Unamortized debt discount and expense	2,027,512.59
Other deferred debits	7,737.88
	$160,530,936.97

LIABILITIES.

Capital stock—common....	$ 18,000,000.00
Capital stock—preferred...	32,000,000.00
Funded debt	49,819,900.00
Advances from system corporations for construction, etc.	22,010,000.00
Bills and accounts payable.	3,560,802.96
Accrued liabilities not due.	2,153,419.02
Liability for employes' benefit fund	500,000.00
Other deferred credit items	152,585.18
Fixed capital reserves	31,880,561.51
Corporate surplus unappropriated	453,668.30
	$160,530,936.97

A great deal of construction work was undertaken during 1921 which included the erection of new exchange buildings in Seattle, Wash., and Modesta, Calif., on land previously acquired for that purpose. New lots were purchased at Pendleton, Ore., and Fresno and Los Angeles, Calif., the total investment in real estate and buildings, as of December 31, 1921, being $11,397,200.42.

Work on the installation of automatic central office equipment in Seattle, Wash., Portland, Ore., and Los Angeles, Calif., is reported as progressing satisfactorily. This work is being done gradually and will extend over a considerable period of time.

A new underground toll cable, about eight and one-half miles in length, was installed during the year to take care of toll lines entering Los Angeles from the north. The existing underground toll cable entering Oakland, Calif., from the south was extended about five miles to San Leandro, making it approximately 10 miles in length. The net additions to plant and equipment during the year amounted to $17,516,389.21.

As of December 31, 1921, the total miles of wire (aerial, underground and submarine) for the system were 2,348,043, an increase of 300,795 for the year. There were also added during the year 178 private branch exchanges and 1,357 miles of phantom circuits. At the close of the year the number of central offices was 693, made up of 210 manual-common battery, 463 manual-magneto and 20 machine switching.

Benefits amounting to $263,781.47 were paid to 2,822 employes during the year. The total number of employes as of December 31, 1921, was 20,667, composed of 7,412 male and 13,255 female.

Report of Prairie Farm (Wis.) Ridgeland and Dallas Company.

The Prairie Farm (Wis.) Ridgeland & Dallas Co-operative Telephone Co. recently issued its annual report for the year 1921.

Revenues for the year amounted to $11,056.36 and expenditures $10,557.32. There was a total labor expenditure of $2,359.60. In the year 1921, 47 telephones were installed, and 39 discontinued. At the end of the year there were 812 telephones in service operated from the exchanges at Prairie Farm, Ridgeland and Sand Creek. Four hundred and forty-seven shareholders and 365 non-shareholders have telephones.

Capital stock of the company amounts to $20,000 and paid up capital stock amounted, at the close of the year 1921, to $13,480. A considerable amount of improvement and repair was done during the year. Six and one-half miles of poles were rebuilt and a new line—two miles of poles and three and one-half miles of wire—was put in. The total line built consisted of 293½ miles of poles, and 556 miles of wire.

Directors of the company are Charles Dean, of Colfax; Sam Hoveland, of Sand Creek; Frank Nichlow, of Dallas; and William Rassbach, of Prairie Farm. F. N. Roemhild, of Prairie Farm, is president and manager of the company; J. M. Rassbach, vice-president; and Magnus Larson, secretary-treasurer. The last two are also residents of Prairie Farm.

Southwestern Bell Preferred Stock Issue Authorized.

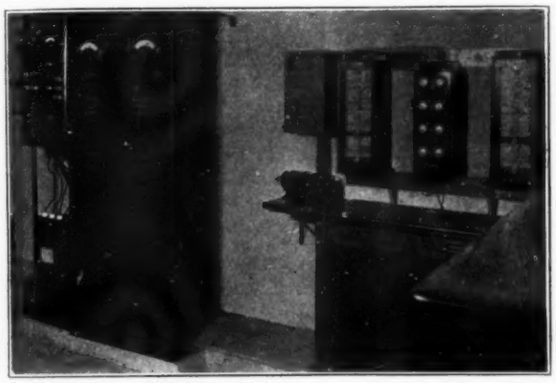
The $7,500,000 preferred stock issue, which was voted by the stockholders of the Southwestern Bell Telephone Co., April 7, 1920, was approved by Missouri Public Service Commission March 7.

The stock, which is 7 per cent cumulative, is to be sold at not less than par, the commission directs, and the proceeds utilized for the acquisition of property, construction, extension and improvement of facilities not properly chargeable to operating expenses.

A Story of Telephone Development

From Group of Farm Lines in 1905 Has Developed the Inland Telephone Co. at Pullman, Wash., with Nearly 1,500 Subscribers—Competition for Business from 1912 to 1915 Was Most Keen

In the year 1905, a number of farm lines that had been run into a hotel in Pullman, Wash., were incorporated into the Inland Co-operative Association. Then the lines were extended into the city and a board



A Neat Power Room Spells Efficiency.

installed in a centrally located building.

The idea of a telephone in the home caused the number of telephones to increase rapidly. Then came the thought of expansion, and exchanges were established in Colfax, the county seat of Whitman county, and at Albion, an intermediate point, with a toll line connecting the exchanges over which free service was given.

In 1907 a contract was entered into with a rival company, under which the rival company did the switching, the companies dividing the territory in which development was to be made. The agreement was for a period of five years. Upon the expiration of the contract, the Inland Co-operative Association desired to renew the contract, but the other company would not do so under the former conditions.

The Inland Co-operative Association then decided to again install a switchboard, and another "bunch" of trouble was encountered. Only part of the farm lines voted to connect with the Inland exchange, but some encouragement was, however, received from the town subscribers of the rival company. A second-hand magneto board was installed, to take over the lines May 1, 1912. A Kellogg magneto board with harmonic ringing had been ordered.

The board, when installed, so increased the local business that it was determined to change from magneto to common battery. A common battery board and equipment were ordered from the Kellogg company, and the installation of this switchboard was completed in January, 1913. The wiring for this installation consisted of 140 common battery lines and 40 magneto lines.

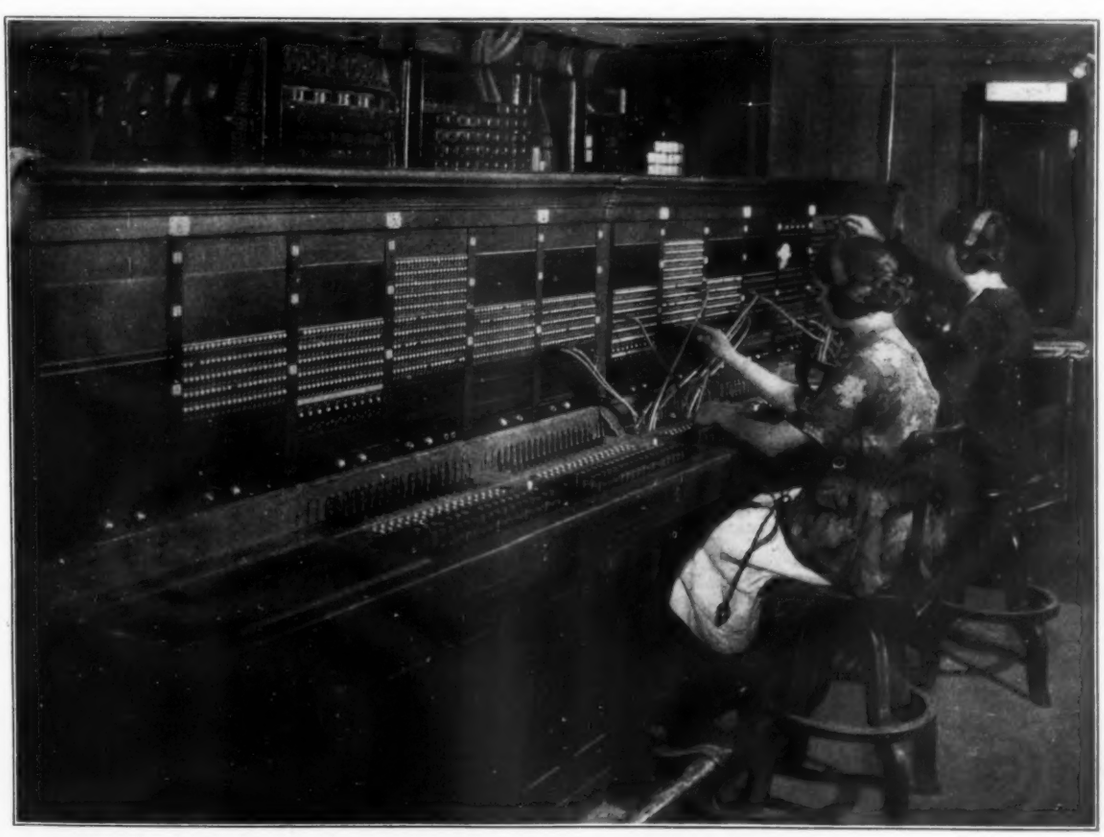
The contest for business between the two telephone companies became very spirited and many times was anything but amiable. The rival company had the lead at the beginning with 335 local subscribers and about one-third of the farm lines, as well as the State College connections.

With all these advantages, including the toll connections, in favor of the rival company, the "Farmers' Company," as it was called, continued to increase its list of subscribers, the harmonic ringing system proving very attractive. Additional lines were added to the board from time to time so that in June, 1914, 300 lines and 45 rural lines had been installed.

The telephone contract of the rival company with the State College expired, both companies making a bid for the college business. October 6, 1914, the Inland Co-operative Association was notified that it was awarded the college contract.

The crisis had passed, and new business began to come in unsolicited, and was followed by a period of negotiations for the purchase of the plant of the rival company. This was accomplished in July, 1915, and the company has since enjoyed a steady growth.

In 1919 there were 780 local subscribers



The Features in the Manual Equipment Are Accomplishing Things in a Service Way at Pullman, Wash.

with the peculiar conditions existing in a college town, where the population is increased from 75 to 100 per cent at the beginning of each college year. This large influx of young people makes a very heavy demand on the traffic to be handled by the operators.

This condition caused the management to investigate some method by means of which the unusual traffic during the rush period could be handled without detracting from the service during the regular periods.

After considering the pros and cons, it was determined to rehabilitate the switchboard with the service features of the Kellogg company. Again difficulties had to be overcome, as it was not thought advisable to do this until permanent quarters had been secured for the exchange.

This was done in 1920 when the present building was purchased and remodeled so that for neatness and convenience it ranks with those found in cities many times the size of Pullman. With the purchase of the building, a contract for the rehabilitation of the switchboard was entered into with the Kellogg company and all the latest features added. This installation has been completed and, during "Visitor's Week," many were the comments of approval and appreciation of the service.

To care for the many improvements, the Inland Co-operative Association was reorganized in January, 1921. The name was changed to the Inland Telephone Co. and the capital stock increased to $60,000. The present officers are: A. T. West, president; Jennie Ruth, vice-president, and J. C. Ruth, secretary-treasurer and manager. The present number of local stations is 956 and the rural subscribers number 400.

Federal Trade Commission Drops Charges Against Western Electric.

The Federal Trade Commission, by its own motion, has ordered the dismissal of the charges of unfair competition brought against the Western Electric Co. in January, 1921. The commission's attorney, after a thorough investigation, during the past 14 months, has failed to find facts to substantiate the original charges.

Action was started against the Western Electric Co. as a result of a complaint filed by a competitor in the manufacture of telephone equipment. It was alleged at the time that by its supply contracts with the Bell telephone companies, the Western Electric was guilty of violating Section 3 of the Clayton Act and Section 5 of the Federal Trade Commission Act.

The investigation undertaken by the Federal Trade Commission was most thorough. For several months experts in corporate practices busied themselves examining the methods of the Western Electric Co. not only at its headquarters at 195 Broadway, New York City, but at its several branches scattered throughout the country. At the same time a careful search was made of the company's relations with its customers and suppliers and its manner of dealing with competition. Failure to substantiate any of the points in the complaint led the commission to drop the charges.

F. Bissell Company of Toledo, Ohio, Moves into New Factory.

The F. Bissell Co., of Toledo, Ohio, jobbers of electrical supplies and power apparatus, has recently moved from 226-230 Huron St., to its own factory at 812-822 Lafayette St. The new location covers half a block, permitting the company to combine practically all of its departments under one roof.

The concentration of stocks and modern handling methods, which include a completely enclosed and heated driveway and loading docks and a railroad siding into the building, together with the proximity of all outbound freight stations, will enable the F. Bissell Co. to greatly increase its efficiency in giving service to the trade.

Noteworthy Improvements Being Made by Oklahoma Companies.

Spring is here! And with it improvements by telephone companies, especially in Oklahoma. Word comes that the Broken Arrow Telephone Co., at Broken Arrow, of which J. W. Walton is manager, has just connected 2,000 feet of overhead telephone cable with the central exchange. It is the intention of the company to put all of its overhead wires into cables as soon as possible.

Then there is the Watonga Telephone Co. at Watonga, Okla., busy laying a system of underground cables for the betterment of the service in that city. Work will go forward as rapidly as revenues will permit until the company has installed a complete underground system.

One of the local papers, in speaking of the Watonga company's improvements, states that the company is doing a work of which every citizen should be proud, not only because of the fine system it is installing, but because it is also giving work to a number of men when jobs are few and hard to get.

E. H. McHenry, manager of the Wagoner Telephone Co., at Wagoner, announces that the company will be in new and enlarged quarters about April 1. The company is spending about $5,000 improving its plant at Wagoner.

Barron County Company Makes Rice Lake, Wis., Headquarters.

The annual meeting of the stockholders of the Barron County Telephone Co., Rice Lake, Wis., was held on February 21. The business of the company for the past year was reported as very satisfactory, and the following directors were elected for the ensuing year: Dr. O. M. Sattre, W. A. Demers, J. E. Horsman and A. G. Strand, of Rice Lake, and Chas. A. Taylor of Barron.

The directors elected these officers: Dr. O. M. Sattre, president; Chas. A. Taylor, vice-president; J. E. Horsman, secretary and general manager, and W. A. Demers, treasurer. A change was made necessary in the officers by the retirement of Dewitt Post, T. W. Borum and C. J. Borum after 26 years of active service. The headquarters of the company were moved at this meeting from Barron to Rice Lake.

The Barron County company has made a very enviable record in the telephone field. It began business February 8, 1896, and now covers the entire county of Barron with exchanges of the common battery type, the latest Kellogg switchboards being installed at Rice Lake and Barron. The company has never failed to discount all bills, and declares an annual dividend of 10 per cent.

Record of Telephone Patents

Printed copies of patents may be secured by addressing the Commissioner of Patents, Washington, D. C., enclosing 10 cents for each copy.

1,401,962. January 3, 1922; filed December 29, 1917. MOISTURE-PROOF RECEIVER; eight claims; J. J. Comer, Chicago; assigned to C. R. Bennett, Kansas City, Mo. Moisture-proof case and waterproof diaphragm.

1,402,202. January 3, 1922; filed September 26, 1919. RINGING ARRANGEMENT FOR MULTIPLEX CIRCUITS; nine claims; H. A. Affel, Brooklyn, N. Y., and J. Davidson, Jr., Montclair, N. J.; assigned to American Telephone & Telegraph Co. A multiplex carrier system.

1,402,546. January 3, 1922; filed June 12, 1919. TELEPHONE RECEIVER; six claims; L. Steinberger, Brooklyn, N. Y. Receiver so designed as to provide a continuous uniform surface without projections or openings adjacent to the inner side of the diaphragm.

1,402,691. January 3, 1922; filed May 20, 1916. TELEPHONY; 118 claims; H. S.

Keep Your Lines Working Regardless of Storms

You receive immunity from service interruptions as well as protection for your property when you install

ARGUS LIGHTNING ARRESTERS

They operate on a principle that effectually "jerks the teeth" of lightning. The arc of lightning discharge is broken up into a dozen or more little discharges, no one of which is of sufficient intensity to do any harm.

ARGUS TYPE "A-C" Arrester is equally efficient in protection against crosses with high tension circuits as it is against lightning.

Two short plates above the ground plate and separated from it by .004 in. offer a safe protection against crosses with high tension lines of 500 to 1200 volts. The air-gap, once broken down by excessive voltage, will carry off in self-extinguishing arcs any currents which will not blow the line fuses.

Our Weatherproof Metal Case containing two Argus Arresters is durable and convenient for outdoor construction.

Let us send you Bulletin No. 33 on Line and Cable Protective Devices.

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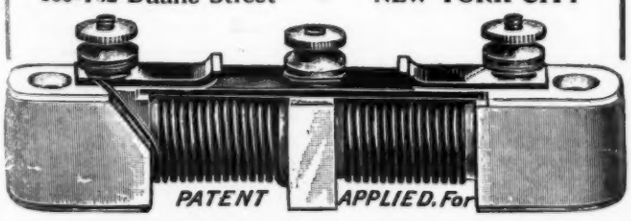

№ 3

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Turner, San Diego, Cal. A telephone exchange system including telephone call distribution and call registering.

1,402,905. January 10, 1922; filed October 18, 1913. TELEPHONE SYSTEM; 41 claims; F. M. Slough, Elyria, Ohio; assigned to Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y. Automatic interruption of the talking strands of the cord circuit.

1,402,936. January 10, 1922; filed June 18, 1917. AUTOMATIC TELEPHONE SYSTEM; 52 claims; H. H. Ide, La Grange, Ill.; assigned to Kellogg Switchboard & Supply Co. Automatic switch.

15,261. (Reissue 992,333, May 16, 1911) January 10, 1922; filed May 28, 1895. ELECTRIC EXCHANGE SYSTEM; 13 claims; A. T. Brown, Syracuse, N. Y.; assigned to Stromberg-Carlson Telephone Mfg. Co. Rochester, N. Y. Automatic system.

1,403,544. January 17, 1922; filed January 29, 1920. TRANSMISSION EQUALIZATION ARRANGEMENT; three claims; W. E. Darrow, Brooklyn, N. Y.; assigned to American Telephone & Telegraph Co. A relay having a number of windings connected in series is placed in the cord circuit. One of the windings is included in the talking circuit and the other is short-circuited by the talking circuit when the relay is unoperated.

1,403,566. January 17, 1922; filed July 11, 1919. VACUUM-TUBE REPEATER CIRCUITS; 17 claims; H. S. Read, East Orange, N. J.; assigned to Western Electric Co., Inc., New York, N. Y. A second vacuum tube maintains the current in the output circuit substantially constant.

1,403,592. January 17, 1922; filed March 20, 1920. TELEPHONE RECEIVER; one claim; A. E. Coy, Chicago. Construction details.

1,403,593. January 17, 1922; filed March 20, 1920. TELEPHONE TRANSMITTER; three claims; A. E. Coy, Chicago. Transmitter secured to battery casing with proper conductor connections.

1,403,626. January 17, 1922; filed April 9, 1919. AUTOMATIC SWITCH FOR CONTROLLING MOTOR-DRIVEN AUTOMATIC MACHINES; three claims; L. M. Potts, Baltimore, Md.; assigned to American Telephone & Telegraph Co., New York, N. Y. Electric motor drive and its control.

1,403,671. January 17, 1922; filed May 2, 1904. TELEPHONE SYSTEM; 79 claims; W. W. Dean, Elyria, Ohio; assigned to Kellogg Switchboard & Supply Co. Two-conductor, automatic switching mechanism.

1,403,767. January 17, 1922; filed December 20, 1919. ELECTROMAGNETIC STEP-BY-STEP MECHANISM; three claims; H. W. Goff, New York, N. Y.; assigned to Western Electric Co. Electromagnet and ratchet and pawl arrangement.

1,403,835. January 17, 1922; filed September 30, 1919. FREQUENCY CONTROL SYSTEM; 26 claims; O. B. Blackwell, Garden City, N. Y.; assigned to American Telephone & Telegraph Co. A method of fixing the frequency relation between a number of non-intercommunicating radio stations by translating a control frequency at each station into frequencies employed for radio transmission.

1,403,841. January 17, 1922; filed September 30, 1919. FREQUENCY CONTROL SYSTEM; 21 claims; J. R. Carson, Montclair, N. J.; assigned to American Telephone & Telegraph Co. Modulating a radio frequency by a frequency too low to radiate, transmitting the resultant frequencies at each of a number of non-communicating radio stations and translating frequencies into frequencies employed for radio transmission.

1,403,844. January 17, 1922; filed March 19, 1918. AUTOMATIC TELEPHONE SYSTEM; five claims; H. P. Clausen, Mount Vernon, N. Y.; assigned to Western Electric Co. Relay control of operating magnet of automatic switch.

1,403,845. January 17, 1922; filed July 19, 1919. TELEPHONE EXCHANGE SYSTEM; five claims; H. P. Clausen, Mount Vernon, N. Y., and C. L. Goodrum, New York; assigned to Western Electric Co. Automatic system with registering device.

1,403,861. January 17, 1922; filed December 29, 1916. TELEPHONE EXCHANGE SYSTEM; 93 claims; A. E. Lundell, New York, N. Y.; assigned to Western Electric Co. Semi-automatic system.

1,403,862. January 17, 1922; filed October 8, 1917. TELEPHONE EXCHANGE SYSTEM; nine claims; A. E. Lundell, New York; assigned to Western Electric Co. Semi-automatic system adapted for party-line operation.

1,403,866. January 17, 1922; filed December 31, 1919. TELEPHONE EXCHANGE SYSTEM; 13 claims; A. Raynsford, New York, N. Y.; assigned to Western Electric Co. Method of connecting manual and automatic systems.

1,404,288. January 24, 1922; filed May 16, 1919. REPEATER TESTING ARRANGEMENT; three claims; W. H. Harden, Brooklyn, N. Y.; assigned to American Telephone & Telegraph Co. A method of testing the condition of balance between one of two line sections balanced by artificial lines and interconnected by a two-way two-element repeater, and its artificial line.

1,414,311. January 24, 1922; filed December 17, 1920. ELECTRICAL TESTING SYSTEM; four claims; H. W. O'Neill, Brooklyn, N. Y.; assigned to Western Electric Co., Inc. A system of measuring small variable electrical currents.

1,404,396. January 24, 1922; filed June 23, 1914. TELEPHONE SYSTEM; four claims; M. Langer, Charlottesburg, near Berlin, Germany; assigned to Siemens & Halske A.-G., Siemenstadt, near Berlin. An automatic telephone system with service meters associated with the telephone lines for registering the conversation.

1,404,313. January 24, 1922; filed May 26, 1921. SANITARY TELEPHONE MOUTHPIECE; three claims; H. S. Wheaton, Dallas, Iowa. A mouthpiece provided with apertures which are opened and closed with the operation of the switchhook.

1,414,416. January 24, 1922; filed March 4, 1918. SEMI-AUTOMATIC TELEPHONE SYSTEM; 22 claims; J. Wicks, Chicago; assigned to Automatic Electric Co. Automatic connection and disconnection of signaling current with the called line and manual means for again applying the ringing current to the called line to operate the signal before the connection is released.

1,404,573. January 24, 1922; filed June 13, 1917. TELEPHONE INSTALLATION IN WIRELESS TELEGRAPHY; four claims; I. N. Brillouin, Paris, and G. A. Beauvis, Lyon, France. A receiver station having a number of electron tubes.

1,404,574. January 24, 1922; filed April 25, 1918. TELEPHONE AND WIRELESS TELEGRAPHY INSTALLATION; seven claims; L. N. Brillouin, Paris, France. A wireless receiving system comprising receiver terminals, an amplifier embodying a series of audions each comprising a filament, a grid, and a plate with connecting circuits.

1,404,584. January 24, 1922; filed July 31, 1919. TELEPHONE RECEIVER; two claims; M. S. Conner, Adelphi, Salford, England. Iron cheeks, one at the lower end of each coil, form an air gap and magnetic shunt between their adjacent edges.

1,404,799. January 31, 1922; filed May 31, 1919. CURRENT SUPPLY FOR VACUUM BULBS; two claims; S. P. Shackleton, New York, N. Y.; assigned to American Telephone & Telegraph Co. Bus bar connections varied by means of differently-wound relays.

1,404,800. January 31, 1922; filed July 20, 1920. TELEPHONE ATTACHMENT; four claims; A. B. Sheller, Claysville, Pa. Separate reciprocable means engaging with the receiver hook and co-operating with the bell striker for actuating it.

1,404,817. January 31, 1922; filed February 28, 1921. TELEPHONE ATTACHMENT; one claim; P. J. Werber, St. Louis, Mo. A rod extending through transmitter face plate to contact with diaphragm to make it non-operable.

1,404,175. January 31, 1922; filed August 22, 1919. TELEPHONE SYSTEM; 16 claims; G. A. Yanochowski, Chicago; assigned to Kellogg Switchboard & Supply Co. Method of ringing for automatic system.

1,405,267. January 31, 1922; filed June 13, 1917. TELEPHONE AND WIRELESS TELEGRAPHY INSTALLATION; four claims; L. N. Brillouin, Paris, and G. A. Beauvis, Caluire, Lyon, France. Connections of tubes in a receiver station.

1,405,298. January 31, 1922; filed May 10, 1920. METAL TELEPHONE DIRECTORY HANGER; two claims; S. S. Dahl, Virginia, Minn. Telephone hanger in the form of a horizontally disposed hook with a T-bar hanger removably held in slot. For attachment to desk stand.

15,277. (Reissue. 1,311,156; July 29, 1919) January 31, 1922; filed September 9, 1920. AUTOMATIC TEST AND RINGING CIRCUITS; 20 claims; H. D. Currier, Chicago, and H. H. Ide, La Grange, Ill.; assigned to Kellogg Switchboard & Supply Co. Manual cord circuit having a test relay for testing the busy or idle condition of called line.

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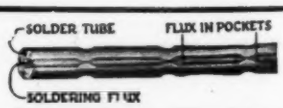

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